

した³²Pで標識したGSをプローブとして用いて、通常の条件下で電気泳動したDNAとハイブリダイズさせる。そして該プローブがどのハイブリッドセルのDNAにハイブリダイズするかを確認することによって、本願発明のGSに対応するDNAが存在する染色体の位置を見出すことができる。各々のGSをラベルしたプローブを用いてヒト全ゲノムDNAを対象にサザンハイブリダイゼーションを行っても各々のGSに対応する単一のバンドが検出されたことから、本願発明のDNAがヒトゲノムDNAに対する好適なプローブとして用いることができることが明らかになった。なお、ヒトゲノムDNAに対する好適なプローブとして使用できれば、ヒトcDNA、ヒトmRNAに対する好適なプローブとして使用できることは明らかである。

また、同様に、PCR法を用いることにより、本願発明のGSがどの染色体に存在するか確認する方法について説明する。

すなわち、GSの塩基配列の中から、通常の方法、例えばコンピューターソフトウェア OLIGO4.0 (National Biosciences社製)により、プライマーとして最も適した塩基配列を選び、常法によりオリゴヌクレオチド(20~24mer)を合成し、プライマーとする。これらのプライマーを用いてPCR法で増幅される部分の長さは50merから100mer程度が望ましい。

次いで、上記単染色体のハイブリッドセルから染色体DNAを抽出したDNAをそのまま鋳型として、先に述べたプライマーを適用し、常法のPCR法により増幅する。PCR産物をアクリルアミド非変性ゲルで電気泳動した後、エチジウムブロマイドによって染色し、蛍光を検出することで該PCR産物の長さの確認を行う。

これらの操作で、それぞれのハイブリッドセル由来のゲノムDNAを鋳型として正しい長さを有するPCR産物が増幅されるか否かにより、プライマーが由来するGSがどの染色体に存在するかを確かめることができる。

以上の操作から、本願発明の各GSに対応するDNAが、どの染色体に存在す

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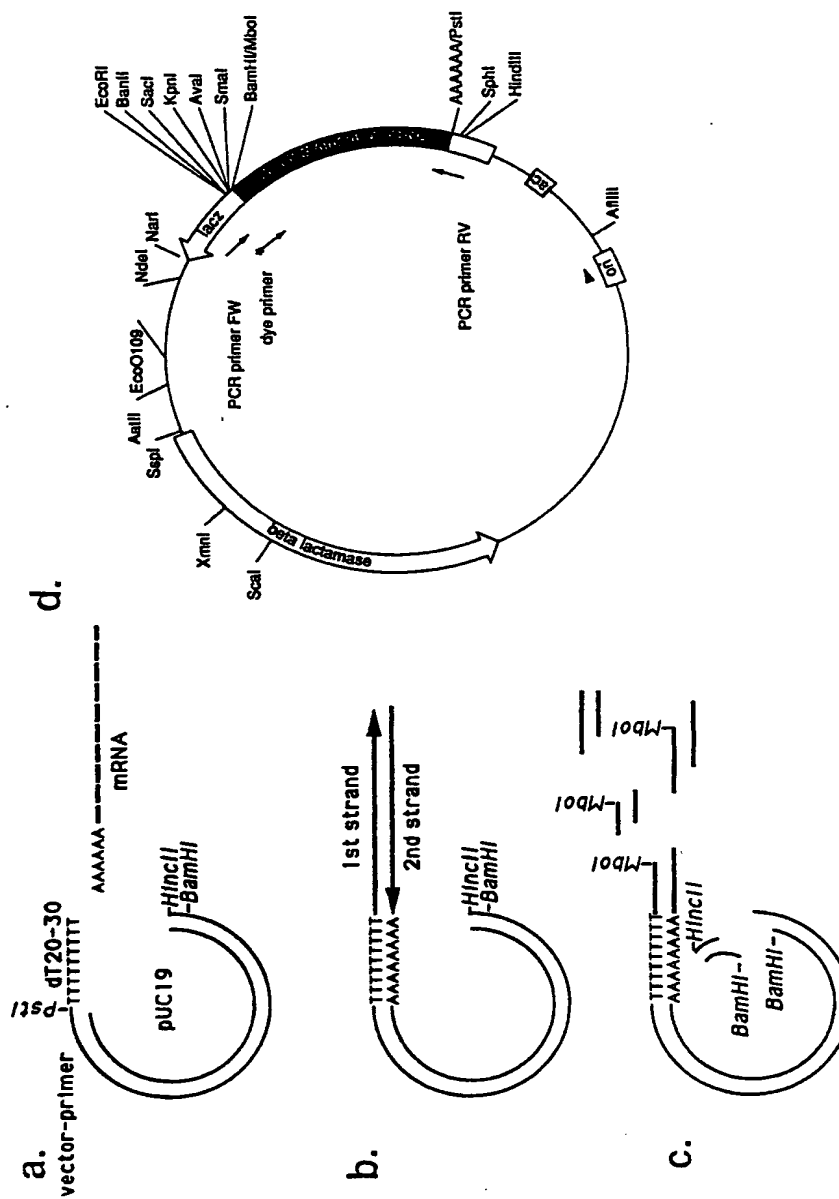


图 2

A

RV (-71) → TGTATGTGTGTGGATTC AGCGGATACAAATTCACACGGA
(5') TCGTATGTGTGTGGATTCGAGCGGATAACAATTCACACGGAACAGCCTATGACCATGATGCGCAAGCTTCATG (Th) → RV (-14)
TTTCACACGGAACAGCCTAT
RV (-36) CAGGAAACAGCTATGACCATG → RV (-29)
RV (-14) ACCATGATTCGCCAAGCTTG
Hind III
FW (-47) T6ACCGGACGAAATGT CAGCACTGACCCCTTTG6GACCG
FW (-21) T6ACCGGACGAAATGT CAGCACTGACCCCTTTG6GACCG
FW (-40) GTTCGACACTGACCCCTTTG
cDNA insert
Sma I Kpn I Sac I EcoR I

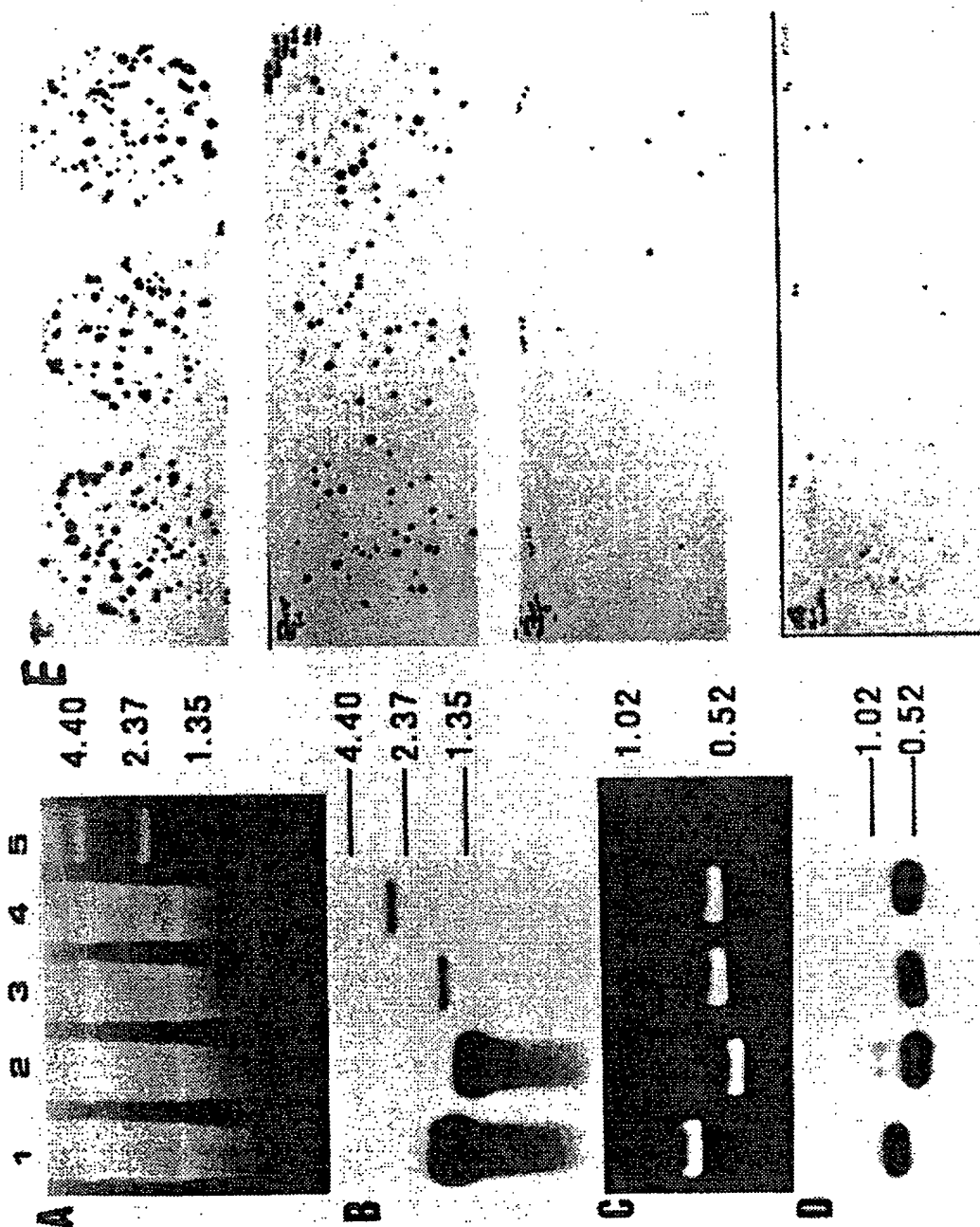
22



3



4



 4

F

probe No.	1	2	3	4
gene	Elongation factor 1- α	α 1-antitrypsin	HnRNP core protein A1	Inter- α -trypsin inhibitor
(a) Band intensity of Northern blot(cpm)	687	423	10	15
(b) Band intensity of control blot(cpm)	133	177	100	127
(c) Normalized signal(a)/(b) $\times 10$	52	24	1	1.2
(d) Positive signals on colony blot	307	119	7	9
(e) Relative representation	44	17	1	1.3

図 5

3 指向 Hep G2 cDNAライブラリーにおける種々の cDNA の存在割合

グループ	クローン	遺伝子	A in 982 (%)	B "in 8,800 (%)"	C "in 26,400 (%)"
I	a15	延長因子-1 A α	22 (2.2)	307 (3.5)	NT
	c321	翻訳的に制御された腫瘍タンパク質	12 (1.2)	89 (1.0)	NT
	tb038	α -1-アンチトリプシン	8 (0.8)	119 (1.4)	NT
	hm01b02	フェリチンの軽鎖	6 (0.6)	62 (0.7)	NT
	c13a04	NAD P (H) メナヂオン・オキシドレダクターゼ	4 (0.4)	27 (0.3)	NT
	hm02d02	リボソーム・タンパク質 S11	3 (0.3)	29 (0.3)	NT
	tb042	ヒトRNPコア・タンパク質 A1	2 (0.2)	7 (0.1)	NT
	s155	未知	1	2	5 (0.02)
	s159	未知	1	2	4 (0.02)
	s639	未知	1	1	3 (0.01)
II	s635	未知	1	0	2 (0.01)
	s170	未知	1	0	1 (0.004)
	s154	未知	1	0	1 (0.004)
	s167	未知	1	0	1 (0.004)
	s645	未知	1	0	1 (0.004)
	s647	未知	1	0	0 (<0.004)
	s632	未知	1	0	0 (<0.004)

Sequences of primers											
GS	CN	Chromosomal position	Sense	Anti-sense	AT	HO	HE	HO	CO	G	T
gs000788	pm2366	1	CAGAGCCCGTAGCACTAT	AAGTTATTGTTGGGTCAG	48	114	115	104	110	1	2
gs001026	pm2444	1	AATGGGACAGTTACACTGA	CCAGCTTCTGCTGACTTGAGA	48	83	84	>200	>200	1	1
gs001075	pm0883	1	TGGACTGTGGATCCTATCT	ACAAGTACCCCTGAATGGCT	48	124	124	103	107	4	4
gs001087	pm1772	1	GTCACTCTCAGCCATAGCAC	ACCATCTCAGCCACACATT	50	104	104	180	>200	6	6
gs001094	pm0347	1	GCCCTAACACAGGAACTC	TAAITCCCACCTCCCGTAAC	51	114	116	>200	200	1	1
gs001116	pm1771	1	GGGTTTCAATAGGGTAGACC	GCCCCAATCTGTCAAAACTG	49	95	95	78	107	1	1
gs001191	pm0609	1	TTGCTGGATTGTAACCTTTG	GGCTGAACATTCACTCTTGG	47	97	97	-	200	1	1
gs001200	pm1351	1	TTAAGAAGACCCTTATGGAGACC	AATAATCTTGGTTAGTCACITAC	47	97	98	-	-	1	1
gs001346	pm0982	1	TCAGGTCTGCTTGGAGGATG	AACTCAGCAGCAGTATTTG	53	120	122	>200	>200	1	1
gs001446	pm1518	1	AAGGTGTACAGGATATTGCAGA	TGCAATAGCCCAATCTCAT	47	130	125	>200	>200	1	1
gs001464	pm1439	1	CCAAAGACCTCCGTTGAACA	TTTGGGAGAGCCATAGACAG	51	100	100	>200	-	1	1
gs001468	pm0427	1	TACTCAGTGGAAAGATAAAG	CAGTGGACCACATTTCTTA	40	98	98	-	-	2	2
gs001521	pm2785	1	CCCAATCAAATGTTAAATG	TTGAAATCAGAGACATGAAGTT	43	102,175	100	>200	>200	1	1
gs001554	pm2291	1	CCAGAGAGTCAAGGGATTG	GGTACAAAGTGCAAAATGACT	46	57	57	78	155	1	1
gs001572	pm2006	1	CCAACATGGTCTAGCACTG	AAACTTTATTGCGACTTCT	44	58	58	>200	>200	4	4
gs000120	pm1350	2	CATGATACTCTTCGGTGGTA	AAACAGTAGTTCACGACATT	46	84	108	-	-	1	1
gs001006	pm1730	2	AGGCTGAATGTGGCATGCT	CCGTTATTGCTACATGCT	48	119	119	93	115	1	1
gs001081	pm0931	2	AAAGCAATACAAATACCAA	TTCAATATGTTTAAACCAGTA	40	90	90	-	-	1	1
gs001090	pm0925	2	TAATGTACACGATGAATAG	TAAATGTAATTAATGCAGGTA	45	88	88	-	-	1	1
gs001213	pm2010	2	CCAGATGAAAGGGAGTCT	CTGGAATATGGAGAAATCAACAG	47	125	125	150	>200	1	1
gs001252	pm0935	2	TCGAGTTTGTCTCTAATAA	GGAATTAATGCTTCAGTTG	43	103	103	-	-	1	1
gs001268	pm2093	2	AGTCCTCTGGCTCCTCAT	TATCGTCAGTGCCTTTATTG	52	137	137	>200	-	1	1
gs001438	pm2435	2	TTTGTACCTACGTAAGAGTACT	ATCCGTGCCACACATAGTGA	45	105	108	-	-	1	2
gs001442	pm1871	2	TTATTAGGGAGTCATATTCTGTG	AGTCCCATTTCTCCACATG	45	67	65	>200	>200	1	2
gs001453	pm1245	2	TTGCTTCCCGTCTCTAAGT	ATGTACAATTTGGGTATAGG	45	75	75	170	190	1	1
gs001535	pm1246	2	ATCTACTGTTTGTGGAAGTG	ACTGATTTTGGTCCCATCTG	44	68	67	-	-	1	1
gs000875	pm0449	3	CGAACATTCACCTCTCAT	ATGATTTATTAGGAGGAA	43	68	68	-	-	3	6
gs001001	pm1758	3	TCGCGCTCTTGGTGTGGA	GGCCACTGAGTACAATGTC	51	115	115	-	-	1	1
gs001218	pm2434	3	AAAGAAAGCACACTGCCTAA	ATGTATAGACAATCCAAAG	42	90	90	-	-	1	1
gs001219	pm0668	3	GTAGTCTCTGCTCCTTTAGC	AAGGATTTGATTTTCTACAT	43	77	77	-	-	1	1
gs001277	pm1729	3	GGTCCTGTTTATTTTGACAT	AAACAAGAGGATGGTTTCCAGA	43	75	75	155	>200	1	1
gs001308	pm1822	3	GATCCTTGGTGTGTAGTTGATC	CTGCAAAATACAGGGAATCAT	46	83	83	160	140	1	1
gs001418	pm2209	3	ACCCAGTCCCCAAATCCAGT	ACACTCCCCCAGCCCTTACT	55	105	105	113	>200	1	1
gs001466	pm2455	3	ATCTAGCTGGCTGTAGTATT	TAAAGAGATGAATTTATTGGT	42	130	130	190	>200	1	1
gs000271	pm1252	4	GTCCTTTGCTATCTGTGTTA	AAGCAATTTATTGAGGTTTA	43	90	90	95	>200	1	3

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gs000448	pm2256	4	GGCCAAAGTTCTCTAGTAT	GTCAGTTTATTACAGCA	42	62	62	62	>200	69	1	2
gs001052	pm1151	4	GTGCCATGCACGTGTGTAT	GTCTATATCCATCATCA	43	80	80	80	-	-	1	1
gs001215	pm0988	4	AGAAATTAATAGCATAGT	TAGAGTCAAGTTGCGTGTG	43	100	100	100	130	-	1	1
gs001298	pm2367	4	ATCAAAGTTTAATTGCTTCA	CATCCATCACATACAAATC	43	116	116	116	>200	180	1	1
gs000992	pm0904	5	TCTGTGAAGAGCAGACAA	TCTAAAGGAAGACAGCATC	49	101	102	102	113	200	1	1
gs000998	pm1889	5	AAGCAATGCCATTATCCACAG	CTAAGAGCTTGAACCCCTTCA	45	87	87	87	>200	>200	1	1
gs001085	pm0319	5	TCACCAGATAATTACAGT	GAGACATAAGCAGGTAAGAT	44	120	120	120	-	-	1	1
gs001101	pm2364	5	TTACCTTACCCTGTCTTTAC	AGACAAATATCCCAAAAGC	47	89	89	89	190	>200	1	1
gs001461	pm1160	5	ATTTGTGAGTGGTTTACTA	AGAAATGGATGCTTTTATTC	43	101	99	99	>200	>200	1	1
gs000053	pm2720	6	AATGTGATAGTCTCTTCTCA	TGCATCCTCAATGTCTTCT	44	78	78	78	72	>200	2	3
gs001326	pm1154	6	CATTGAGCAGCAGCAACAG	CCTGCCCTCTTCTCTGAGTA	53	102	104	104	145	200	1	1
gs001434	pm1216	6	TAGGCAAAACAGGAGAAGAG	AAGGAGCTGGTGTACAGTTC	48	65	65	65	110	>200	1	1
gs001457	pm1785	6	TATATGCAAAATATCCAAAGCTG	TCTATATCTGGTCCCTTATCT	46	80, >200	90	>200	>200	>200	1	1
gs001523	pm0285	6	TTGTAACGTGTGTCGTGAGT	TTTAAATGTCTATGGTAAT	42	86	70	>200	100	1	1	1
gs001525	pm0328	6	GCACCTAAGCCTCCCAAGT	TTTTATATCAGTCCAAGAGC	49	138	138	138	>200	>200	1	1
gs001562	pm2619	6	TCTGCAATTGACAAAGACCAC	TTTGAGATTTTATGAGTCAATC	43	82	62	>200	45	1	1	1
gs000624	pm0891	7	GACCTGAAGTGTGAATGAGT	AACCTAGCTTATGGGATTT	45	119	119	>200	-	-	1	2
gs001145	pm0281	7	AGCCAAAGTCGGGTCTATCT	CCACGGACAGGTGAGTCAT	56	159	159	159	115	>200	4	4
gs001469	pm0219	7	AATCATTTGGCGAGACTGTA	AAGACAACCTTATCCAGACA	45	88	89	130	-	-	1	1
gs001579	pm1102	7	TCAGGAGTCTGCTCAGATA	TTTCAGGTTAATCTGTTTA	44	77	76	170	-	-	1	1
gs001207	pm0956	8	AACAGTATGCGTGTGCAGACTAG	TCCATTAATAAGCCAGTCTCAG	47	81	81	105	70	1	1	1
gs001176	pm2527	9	TTGCCCTCTAATGGTGTCTAC	AAAAACAGAACACACTAAG	48	99	99	118	180	1	1	1
gs001248	pm2708	9	TGTATTGGATTGGATCTC	CAAAAGCAAAACAGCAGATA	44	95	95	-	85	1	1	1
gs000280	pm0895	97	TTGCCATCAAAACATACATA	CTTGTGAGTTTGGTTCCTG	43	55	55	-	-	-	1	1
gs001055	pm0959	97	TTAAGAATCAACCCTCATTG	CACATGCTTATGGAACACT	44	74	74	74	72	73	1	1
gs001157	pm0547	10	AAGTATTGTGCAAGATGTA	AAGAAACACTGCCCTGTGG	45	138	138	>200	>200	>200	2	3
gs001288	pm2245	10	TGTGAATGCTATCTCTCT	GCAATCGTTTCCATATCAGT	47	100	100	200	>200	>200	1	1
gs000228	pm2664	11	ATCAAAACAAACATCCAGA	ACTATAATATGCTCCAACT	42	117	121	134	95	2	2	2
gs001199	pm0880	11	GAATAGCTGGAGATTTCAC	GGAGATCATACCTTCAGCA	46	100	100	84	95	1	1	1
gs001315	pm0445	11	AAAGTGACCTTGAGCAGCTGG	TGAGCCAAATATACATGCTGACT	50	153	153	>200	160	1	2	2
gs001352	pm2943	11	AGGGTGAAGGGTATTTTACG	CACATCATGGTTGAGAGCTA	47	83	85	-	-	-	2	2
gs001489	pm0559	11	AACCCCTAGTAAGGCAATG	TTATTAACCAATCCAGTA	37	47	47	125	53	1	1	1
gs001570	pm2810	11	CTGTAAGGGTTTTTGGAAATTATGT	TTTCATTTTCTACAGATTATTT	42	75, 82	75	145	>200	>200	3	3
gs000279	pm0266	12	AGTGATGGAAGACCTTGAG	GTTCAATTGAAACGGTGTAGC	48	130	130	103	>200	>200	1	2
gs001163	pm2758	12	TCTCCCTATTCAACACAGT	AATGATTCTGAGGATAGCA	49	88	88	>200	120	1	2	2
gs001193	pm1193	12	CACAGCATAAAAGATCATATA	ACCCTAATTAGTTTCTCAG	46	100	100	-	-	-	1	1
gs001235	pm2790	12	CATCATGGTACAGTCAGAAG	CAGTTTGTCAAAATGTATTG	44	83	82	93	87	1	1	1
gs001274	pm1355	12	AGATGTGATATCTCTCATGG	GAGAACAGGTAAGCAACAC	47	87	87	>200	>200	>200	1	1
gs001308	pm0368	12	CCAAAGTGTAGGGTTACAG	TTCAATAGACCTTGGGTTAC	47	95, 165	95	>200	>200	>200	1	1
gs000159	pm2845	13	CTAAGATTTAATGCCGATCC	AGTTAGTGTATGCCAGAGGA	46	104	104	>200	>200	-	1	2



gs001044	pm1659	13	TTGTAAGCCTATCAGAGTCA	AGACAGACTATGCCATCTA	44	109,200	109	>200	100	1	1
gs001290	pm1731	13	GCTTCTCTGTGCTGTGGT	GCAGTTATCATGGCTATTCTCC	50	122	122	>200	180	1	1
gs001362	pm0118	13	ACTGAATGGAACATAGTCT	TACATTACATGACATGTGA	40	61	61	95	103	1	1
gs001366	pm0364	13	TGCTTAGCTTTCCCTCCTTA	GAGCATTTCTGTGTTCTTA	45	67	67	-	-	1	1
gs001389	pm2301	13	CATGAACCTGCTCAGGACAA	GCTTACTTTAATGCTGACC	51	100	100	100,200	-	1	1
gs001492	pm0541	13	AAATGAATGTAATAGCACT	ATTAGTTTACAGGGAGAT	41	72	72	-	74	1	1
gs001367	pm0441	14	GTTTAAGTTTTGATTGGG	CATCCAGTCTACATTTCT	41	77	77	>200	180	3	4
gs001584	pm2307	14	CGTTCCTAAACTCTGAATC	AATGCTCATTTATTGTCAAG	42	55	55	>200	>200	1	1
gs001576	pm2019	14	ATCACAATTACCTTTAGTTG	ACGATAACTTTATTGGAGAT	39	69	69	-	-	1	1
gs001339	pm2220	15	TCCCCATCTCAGTTGAAGT	TGAGAACAAGGAACCCAGT	47	70	70	80	150	1	1
gs000980	pm0985	16	TTGGAATGGAACCTTGCTA	ACTATGCTGCTGAATGG	48	79	79	66	70	2	2
gs001242	pm1127	16	CCCTGTGTTTTACATGTTCA	TAITAAATCTCCCATTCAT	44	105	105	103	102	2	2
gs001516	pm2543	16	ACAGTGTAAATCAAGGTTG	TCTGACACTCAAGTGCAT	45	70	70	>200	-	1	1
gs001566	pm0913	16	TTTGTGCGGACTATGTAAT	TCACITTTAATGGGAACCG	41	53	53	>200	>200	1	1
gs000806	pm1157	17	CTCTCCATGTTCTTACAAG	TAGAAGGAGAATCTGTGGTT	47	77	77	140	>200	2	3
gs001015	pm2369	17	ATAATCACCTCCCATCCAT	TCAATACGCTGCTCAAGC	50	80	80	>200	>200	1	1
gs001156	pm0202	17	CAGAAATTAAGTSCAGCAAT	TGATATCGCATCTTTAAGT	45	103	100	>200	>200	2	2
gs001173	pm2117	17	AAATCTGTGGTTATTCC	GTGATCTACTGTACATTC	41	118	118	145	200	1	1
gs001301	pm1878	17	TAAATTTGGAAATCTCTTGA	ACACATTTGGTTCCTTTAAC	47	100	100	95	97	1	1
gs001316	pm0514	17	TGTGACAGCAGCAGCTTCAT	TGTCATTTTATTCACC	45	128	129	-	1	1	1
gs001356	pm0538	17	CATCTCACAGACAGGAAC	ACCTAAGAGTCCAGAGAAC	48	90	90	69	>200	1	1
gs001495	pm2212	17	TGACTGCAATAAGAGTTGT	GAACATACCACGTTTATTGT	46	90	90	180	>200	1	1
gs001522	pm0642	17	GTCTCAGCAGATTTCAAGT	ACTTCTCTTGAGGACACA	45	68	68	160	-	1	1
gs001078	pm1815	19	TGTGTTCTCCAGCTTTGTAG	GTTCATTCCTGTTGTACAG	48	65	65	>200	>200	1	1
gs001417	pm0289	19	GGATCAGACCAACAGTGCTG	GCAAGGTATAAACAGATTA	46	90	90	-	-	1	1
gs001467	pm1688	19	GAAGCCACCCCTGCACCTCA	GGAGAGTATTGGGAACGGT	54	93	93	>200	>200	2	2
gs001069	pm1879	20	GCCATGCTGTAAAGTATGT	TTAGAAGCCATTAGTAGGATA	48	140	140	-	-	1	1
gs001088	pm1146	20	GCCCTAGGATTCACTGCTC	ACCACCAAGTCTTTCAGG	52	66	66	180	>200	1	1
gs001089	pm0112	20	TGCTGGATGACTTCTACACG	TCCCTATCATGCTGCTGTT	49	59	59	59,115	59	1	1
gs001128	pm0332	20	CTGCTCGGTAGTCTGACTC	CAATGGTCTAAGAGGACAT	49	135	135	153	180	1	1
gs001132	pm0647	20	CTGATGATGATGGAACA	ATCTAGTCCCAACCCAGTA	48	109	109	-	-	1	1
gs001158	pm1774	20	GGAGCCACATGGATTGATG	AAATGACCCCTGGCACCTC	52	124	124	>200	>200	1	1
gs001210	pm1235	20	AGCATCTGTTATGCTTA	GGAGCAGATGAACCTTAC	44	90	90	>200	>200	1	1
gs001377	pm1701	20	TCCATGGTGTAGAAGCCAG	CCACATCTCCACAGGGAGT	54	142	142	>200	74	1	1
gs001395	pm2101	21	GTGAGCTCAATGCTACACAG	TTTATAGTCAACACAGAGT	45	130	130	180	>200	1	2
gs001427	pm0648	21	CTTCTGCTATAAAGTAGAG	ACAAITGGTTCAGTAAATGA	39	58	58	145	>200	1	1
gs000978	pm0912	22	GGTGTAGTGAACCAATTAG	AGTTGACCCATCTCTGTGC	46	124	124	>200	>200	1	1
gs001444	pm0911	22	GGTCTGTTCTCCCATCTGT	AGAAAGCCCAAGTAGTCC	48	65,88	65	100	125	1	2
gs001473	pm2231	22	TGAGCTGCATCTACCTGTGAGAG	AAGCAGTTGAGTTGGTTTCT	50	94	94	67	135	2	4
gs001479	pm2328	22	TACAGCCCTCCACGCTAAC	TTTATTGTCATCAGTACAA	46	65	65	190	>200	1	1



gs000999	pml759	X	CTGCATAGTTACCTGGATT	TCACCACACATATTAGCA	47	103	-	-	1	1
gs001149	pml2180	X	GGAGGGAGATATAGATTGT	AAAAAATCCAGAGACTGA	46	70	135	150	1	1
gs001161	pml0608	X	TTCTATAAGTGTGACCAAGT	GGAGGATTTGAGATACACAT	40	85	>200	77	1	1
gs001406	pml294	X	TAATGCCAGTGAATGTTGGGTAA	GTAAGGTTATCTTGGCATCAGA	47	82	>200	80	2	3
gs001168	pml2289	1,18	ATCCTGCTGAAATACATCTG	GGGAGAGACATCACATGAC	46	70	70	68	130	1
gs001436	pml0113	1,2,12,13,Y	GATCCGATGGGAGTGTAAAT	AATACAAAGCTAAACCAACAA	44	69	69	170	-	1
gs001404	pml2272	1,2,3,5,8,12,14,17,X	TGGAATGTGACATCTCTAT	TTTATTGTAACAAGCAACT	43	130	130	150	132	2
gs000803	pml0314	1,2,6,X	TATCAAGCTGAATGTCTAC	TTACTGAATCCAGCCAACTCA	45	93	93	110	-	1
gs000140	pml1461	1,3,4,5,8,16	TCCAATGAAGAGGTGTAA	AGTTGACAGCCAGGTGAATG	48	96	96	100	100	1
gs001354	pml1561	2,20,21,22	GTCTGTCAGCCAAAGATTCA	TTTTTATTGTTGCTCCAAGT	48	110	110	170	150	1
gs000336	pml2795	2,4,5,10,12,15,17,20,22,Y	GACCTGTGACATCTGGACT	TTATATGGTTGTTAAGACTCG	43	61	61	-	-	2
gs001077	pml0943	2,5,14+C	GCCTTGTTATTCACCACTC	ATCTCCCTTTGCTCCAGTTA	46	82	82	>200	82	1
gs001192	pml1853	2,9,12	TCTGAGGACATTCGAAGACAG	CAGTCAAAACCAACACCGTAT	49	95	95	93	160	1
gs000213	pml1778	2,9,13,17,X	TGCAATAAGGGAAGACCA	CCGTTAGGTGATGAATG	49	78	80	>200	>200	1
gs000919	pml0885	20,X	GTCATTTGTATGCAATTCC	ACATTTTATTTTTCAACG	37	45	45	-	-	1
gs001109	pml0457	3,10,15	CATGTACTCAGAGGCATTC	GCAACTACAATCCAAACT	50	133	133	>200	150	2
gs000071	pml2651	3,4+M	CAGGACTGGAGCAGGAAG	GATTTAACCCATTAGGAAGC	50	101	101	101	88	3
gs001426	pml2632	3,6	TTAGGAAATATGTTAGACAG	ATAGTATGGTTGACACAGTA	43	80	80	>200	120	1
gs001391	pml1133	3,8	TGGATTGCTTTACCTTGT	ACACCTCAGGAGATGTTAC	47	93	93	95	>200	1
gs000077	pml2258	3,9,10,15	GCATCAAGCCAAATCAGA	CITCTTAACACCAACAGCAG	50	96	96	>200	125	2
gs000805	pml0626	4,6	GGATTATTTGCTGTCTAT	GTTATGTACGGCATTTAC	44	105	100	>200	>200	2
gs001212	pml1234	6,20	GCATTAAACAGGAACAATA	CTGTCCATGTGGCATAAACC	44	110	110	105	107	1
gs001312	pml0606	7,18	AGATGCTAACAATTAGGGATA	TTTACACATACAGAGGAGT	43	81	81	102	-	1
gs001441	pml1253	9,11	CCAGACTACAGGCTGATGGC	CCCTTACCCAGCACTCTT	55	75,130	75	>200	>200	1
gs001357	pml0115	9,M	ACCAATGTCACTGCTCTAAATA	CCCATAAAGTGAAGAGGTAGTC	48	125,155	127	125	>200	1
gs001261	pml0428	10,15,22	AAGAAATGTTTACTGGATT	TTATCTGACTGGAGGAAT	42	107	107	-	-	1
gs001456	pml2420	10,15,22	ACTACCCCTGAGATAITAGTT	TTCAITTAITTAGTATTGA	46	100	100	170	-	1
gs000290	pml2303	11+M	ATACCACTCCGCTGTACG	GAGGAGCGTCTAGTGTCTT	50	72	74	72	>200	3
gs000314	pml2643	12,19	GCACCAAGAACGAGTTCAG	TTGGGAATGAGAAAAAATCT	46	83	83	81	-	1
gs000403	pml2773	12+M	GATCTCAGTCTGCGTTTATT	TACATACAAGATGCAAAACAGT	44	80	80	79	68	1
gs001487	pml2725	13,16	ATCTGTGTGCTGCTTCC	GTCTCTCTCTGATGGCTGA	46	62	60	135	180	1
gs000976	pml2780	14,16	AACCTGTTTTACCGCATCTT	AGGTTATTGTCCACAGAA	48	87	87	>200	>200	1
gs001435	pml1683	17,20+C	TGTTGGTTCACCATTTGAGAC	AGAACACACATCAAGATGC	46	90	90	>200	90	1
gs001393	pml1748	17,22,Y	GATGTTCATCCAAGACGTAG	CTAGTTATCTCTGGCTCTG	44	81	81	>200	200	1
gs000096	pml0964	17+C	TTTATCCAGCAAGCACACAC	TCTCTCTCTCTCTCTCTC	49	120	120	>200	170	4
gs001369	pml2217	17+C	ACTTAAAGTAGCTTTGACG	TGCTCTCTGCTGTGATAATA	43	95	95	>200	95	1
gs001440	pml1213	18+C	CCCCAGTTAAAGATTATTGT	AGTGACGATGGAAGATGTA	44	92	92	-	92	1
gs001217	pml1118	19,20	TGCAGAGTATTTTCCAGAG	CGTAGGTCATCTTTTCAGC	46	75	72	160	65	1
gs001009	pml2824	19,22	ATCCCTCTGTCTATTACAC	GCTGTTTAACTCACTTCAC	46	110	110	130	170	2
gs001172	pml0887	19,22	GCCTGCATCTGTGTGACTT	AACCTCTGGGAACAAATCAT	48	91	89	160	86	1

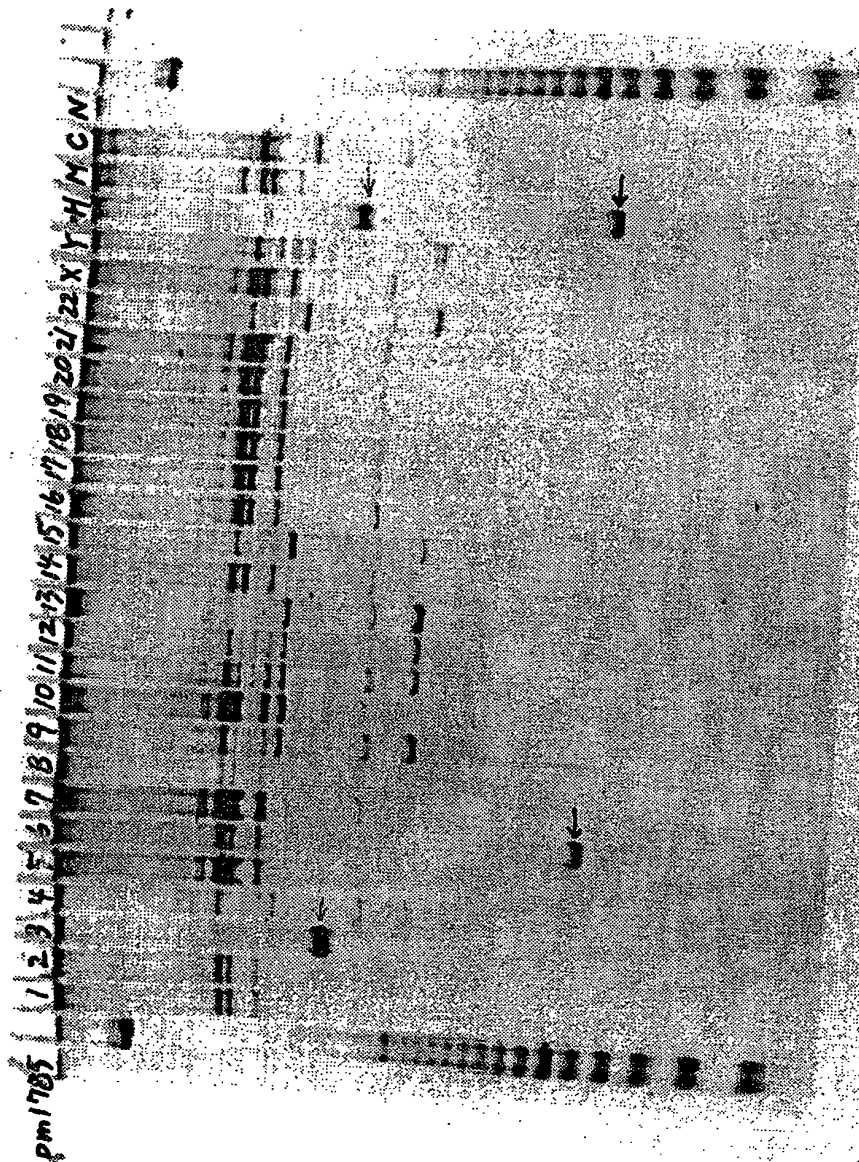
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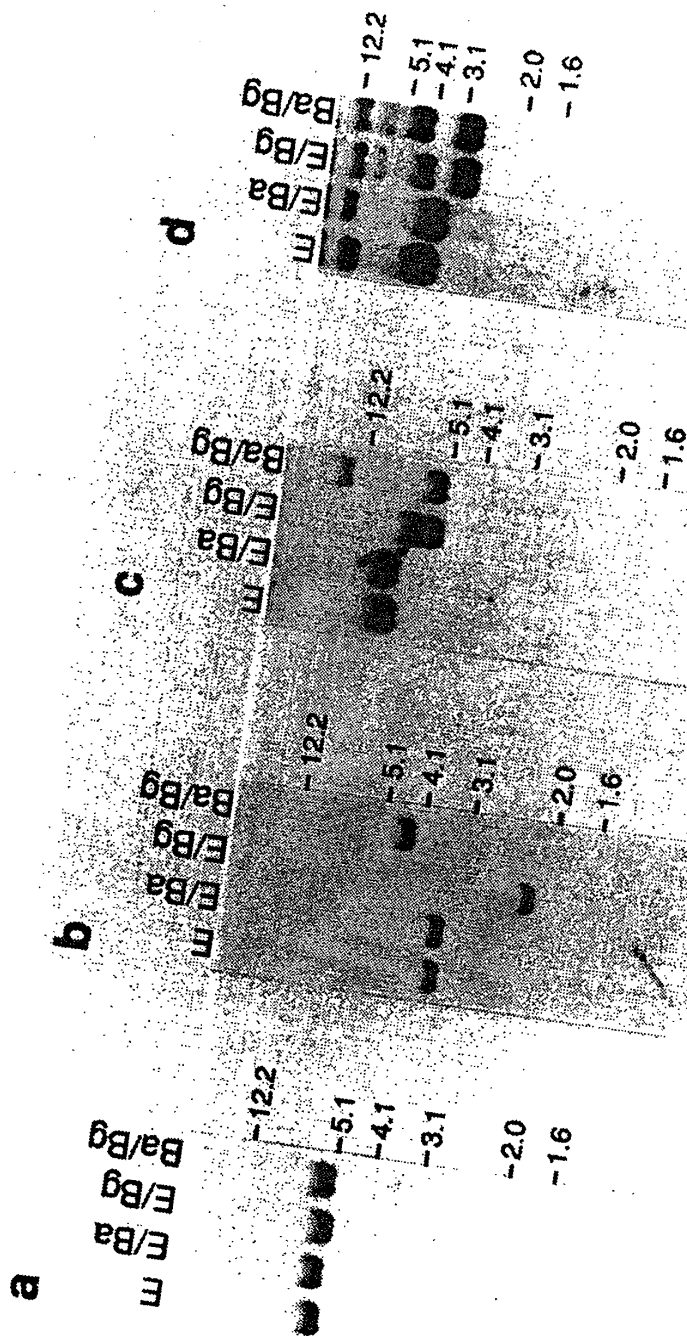
gs001057	pm2049	G	AGGACACAAACACAGCTAT	TTTTCTGATTGACATGAC	45	75	75	101	75	1	1
gs000473	pm1753	M	ATCTCTTTGTAGCCATCTG	GTAAAGTGCTGATGCCATT	42	64,100	64	64	>200	1	1
gs001096	pm2236	M	GTAGAGCTGCATTGACTACC	ACAGACAAGGAATAATCATA	42	108,96	110	110	112	1	1
gs001166	pm0506	M	GTCCACAGTCCAGCCTAAC	GCCACATATTAGAAATCCATC	46	74	74	74	>200	1	1
gs001454	pm2354	M	TGCTCTTTGTGAGCTCTGCCT	TTTAACAGTCAATAAATACATGTT	44	110	110	110	106	1	1
gs000029	pm2492	M+C	GCTAGAAAGAGGGGCACTCA	CTTAACCTCGATAGCCAGGTC	46	75	75	75	75	1	1
gs000253	pm2786	M+C	CACAAACAGCAAACTTCAG	ATGGTTATTTATCAGATTG	41	83	83	82	83	2	3
gs000285	pm1704	M+C	TCACCCACAGAGAACACACT	AATCATAGGGAATAGGTTG	48	75,130	75	75	75	1	23
gs000302	pm2318	M+C	TCGAGAAAGGACAAAATCACC	GAACAGGGTTAGTCCATTCCG	48	58	58	58	58	1	1
gs000543	pm1689	M+C	CATGAGGCTACGGAAACAGG	AGGAGTCCGTGGGTCTTGAG	51	84	84	84	84	4	18
gs000675	pm1442	M+C	AAAGCATCTTGAGAGGAACA	GGAGGACTCGCTGGTCTTAA	49	110,>200	110	110	110	1	9
gs000732	pm1452	M+C	GCACAGATACCTTTACACC	TGGTTCATTTAGTTCCTTC	51	102	105	102	102	3	13
gs000995	pm2688	M+C	GAAGCTCTGTGAGGAAAGT	CAGACCCCATCTTTATACC	47	79	79	79	79	3	4
gs001016	pm2783	M+C	ACGATATTTATAGTGATGTG	TCAAAACTTTAATATATGCT	40	93	93	91	92	1	1
gs001053	pm1144	M+C	AGATGAGTGGGTGCAGAGA	CCATCTCTGTCATCCAGTT	52	135	140	135	135	1	1
gs001127	pm2290	M+C	ACTGGTGATGGAAGGTACA	CCACACAGTGAACCCGCTCT	47	55	55	55	55	1	1
gs001167	pm1626	M+C	GAGAGCCCTTGCATCCTTA	CTTCCCTTTGGTCTTTCTGT	49	100	100	100	100	1	1
gs001216	pm2109	M+C	TAGTCAGAGATTCACTAAGT	ACATGTAATTTGATAGTCTT	42	110	110	110	110	1	2
gs001253	pm1240	M+C	AACGTGTTCCATCAAGACTG	AGTGAATAAATCTCCACTCC	48	120	120	120	120	1	1
gs001281	pm1131	M+C	ACTTAAACCCACCACAGAT	ACAACAGCAGTCAATAGAA	47	97	97	97	97	1	1
gs001375	pm0952	M+C	AAGAGGAGTTTCCCTGCTCA	ATCATGGCAGATGCAAGGA	51	89	89	89	150	1	1
gs001396	pm2216	M+C	ATGTCATGACCTATAATCT	CGTTCTCTTTAATTTGACAT	45	108	108	108	108	1	1
gs001411	pm0958	M+C	ATGGGTTATCAGGGGTTTC	GAGACCAAGGCACATCTTAA	47	80	77	80	80	1	1
gs001460	pm2626	M+C	ACATTGAATGGGATGAGGT	GGACATTTCTAGCCACAGC	51	75,55	75	75	75	1	2
gs001482	pm1210	M+C	TTGTGACATTCTCTTTAGAA	CAGTGCCTCTGTACTGAGACA	46	85	85	85	85	1	2
gs001490	pm0109	M+C	CCCCACAGAGACATCATCT	TCTTAGTAGGTGCTCTGGTG	51	98	98	98	98	1	1
gs000188	pm2042	No product	CAACAGTTAGCGTGAAGT	GAATAATCCTGTCTCATCTA	45	87	87	-	-	1	1
gs000850	pm0304	No product	CTTTGGGATATTTCTTCAT	CCCTCGGTACTTTTCTATG	43	60	60	62	-	1	2
gs000983	pm0808	No product	AGCCAGCCTCTTTGTATGTG	CTGGATTGATTTTTCATAG	44	87	87	-	112	1	1
gs001254	pm1673	No product	TGTGGTATGAAATATCTGA	TTATGAATGAAGACAACACT	43	98	98	163	>200	1	1
gs001365	pm2908	No product	CAGTAGTGCTTTTGAATG	TTTATGAAATGTGGTGT	41	63	63	-	150	3	3
gs001373	pm0361	No product	TACAGCCGCTCTAAAGTC	TTTGAGCATCAAGGAATCT	46	82	82	-	>200	1	1
gs001556	pm0849	No product	TACATCTTCAGACTCATCG	TTTCAAAACTTTATCTT	40	86	86	>200	100	1	1
gs001574	pm1284	No product	ATCAGAGCTCAGTTCCTGTAG	AITTTGCCTCTGCATGGTC	44	57	57	67	67	2	2
gs001622	pm1606	No product	GATCTGAGCCCTTAAGTGA	TTTGCAGTCAAGCTTATTC	45	54	54	-	-	1	1
gs001640	pm0852	No product	GATCTCTGTCTCTTTTACA	TTTAAACAGACACCATAC	36	45	45	-	-	1	1

1 1

pm 2209 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 x y h n c n

図 1 2





14

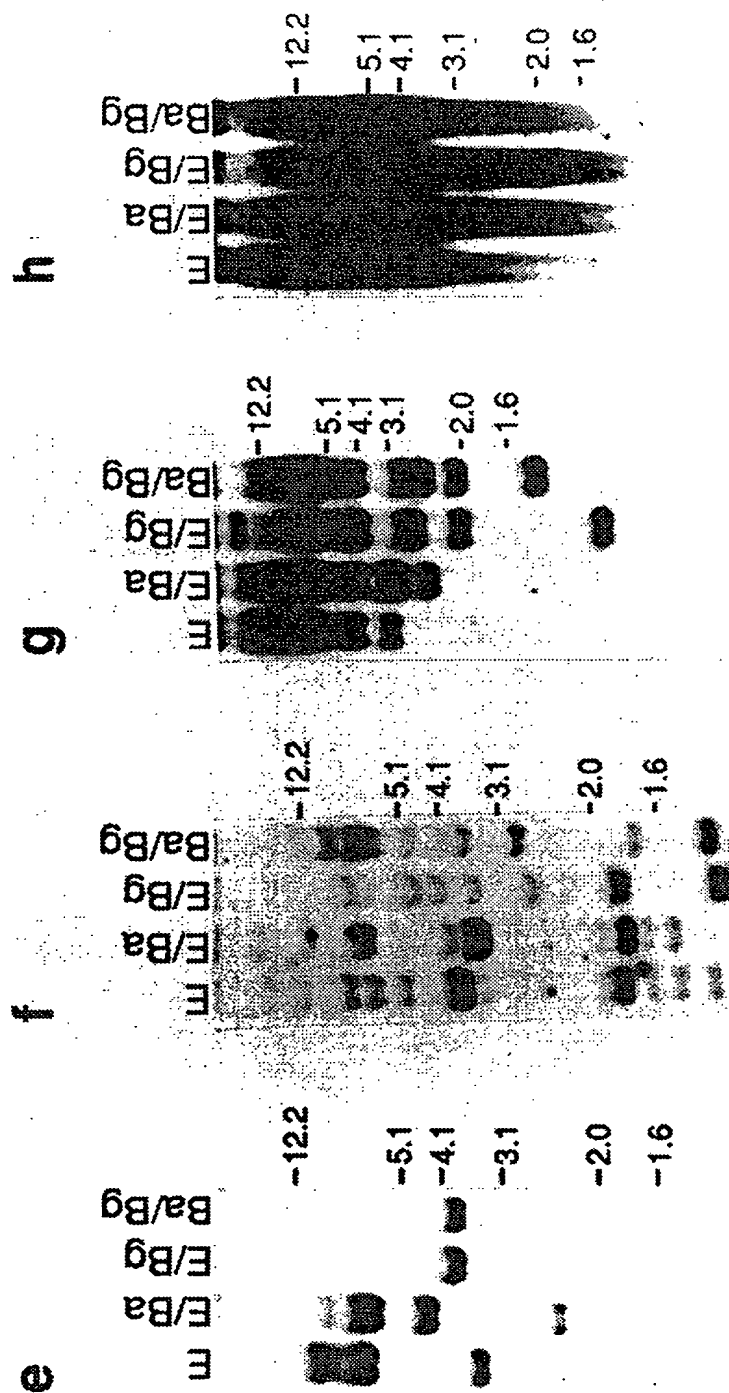


図 15

サザンハイブリダイゼーションに用いたハイブリットセル

ハイブリット セルの名称 ヒト染色体の番号		親細胞	インタクトな 染色体(%)	転座した 染色体(%)
A9(neo-1)-4	1	A9	100 (0)	0
A9(neo-2)-1	2	A9	93 (8)	0
GM10253	3	CHO	100 (0)	0
GM10115	4	CHO	100 (0)	0
A9(neo-5)-4	5	A9	40 (0)	90
A9(neo-6)-3	6	A9	100 (60)	0
A9(neo-7)-2	7	A9	100 (89)	0
A9(neo-8)-1	8	A9	91 (82)	0
GM10611	9	CHO	79 (5)	11
A9(neo-10)-3	10	A9	94 (6)	75
A9(neo-11)-1	11	A9	24 (0)	76
GM10927A *	11	CHO	96 (21)	4
A9(neo-12)-4	12	A9	0 (0)	100
GM10868 *	12	CHO	82 (6)	0
GM10898	13	CHO	82 (0)	10
GM10479	14	3T6	76 (29)	0
A9(neo-15)-2	15	A9	9 (0)	78
GM11418 *	15	CHO	62 (0)	100
GM10567	16	A9	69 (0)	0
GM10498	17	LTMK	80 (10)	0
A9(neo-18)-5	18	A9	100 (66)	0
A9(neo-19)-1	19	A9	92 (23)	8
A9(neo-20)-3	20	A9	81 (5)	17
GM08854	21	A9	81 (24)	0
GM10027	22	CHO	93 (0)	100
GM10324	X	A9	81 (10)	0
GM06317	Y	CHW1103	91 (0)	9

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a

Chromosome

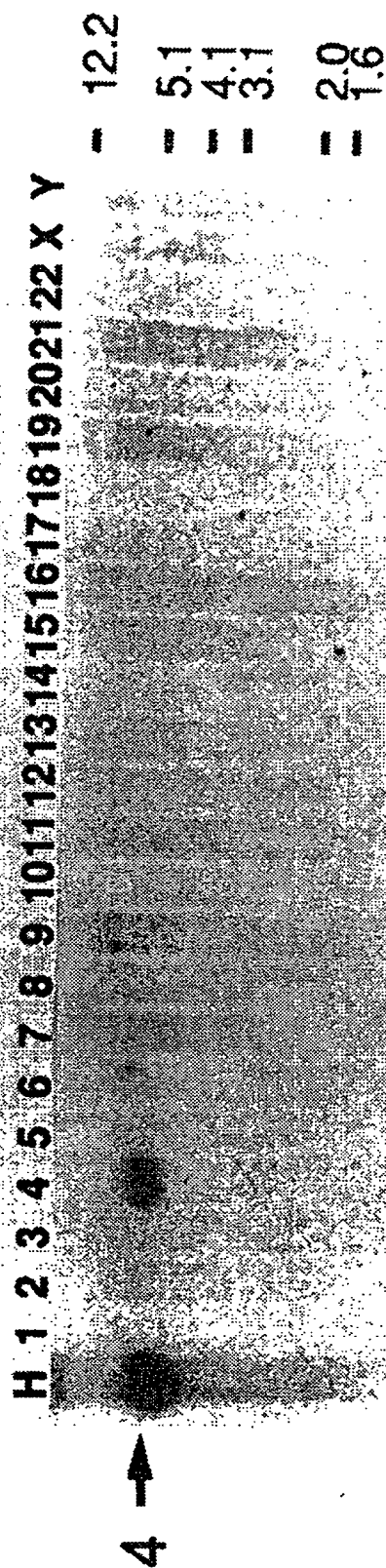
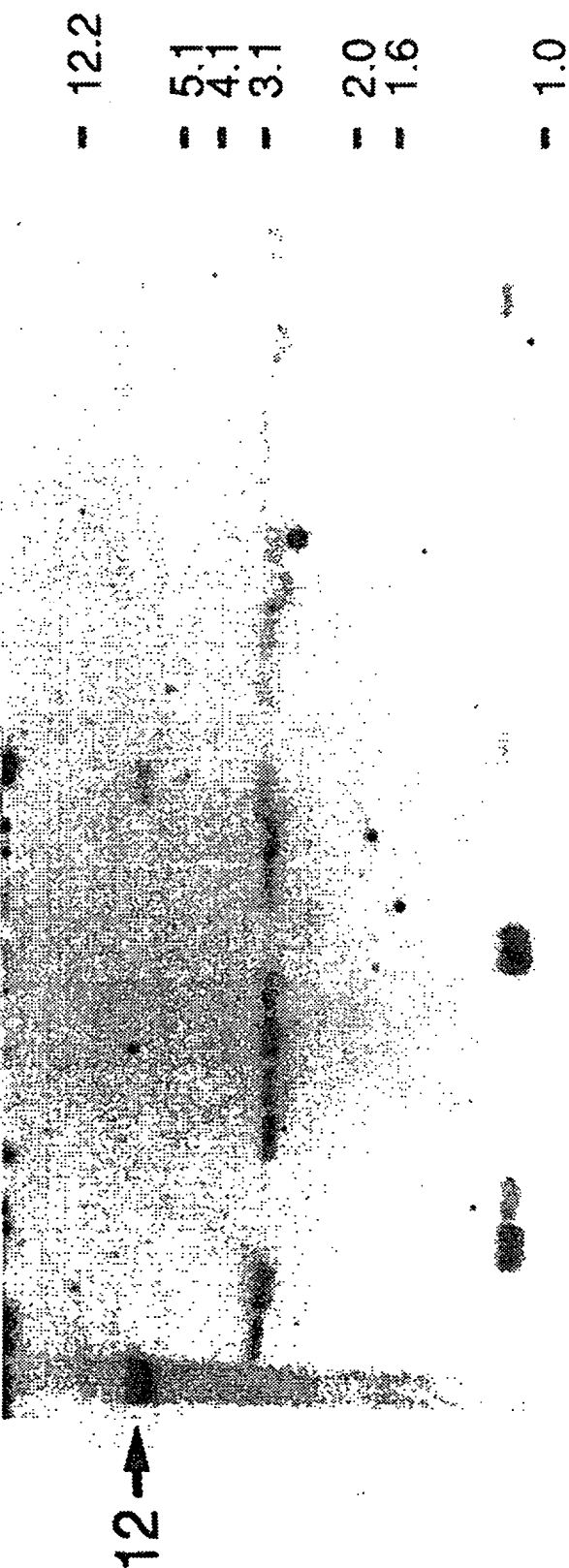


図 17

b

Chromosome

H 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 X Y



18

C

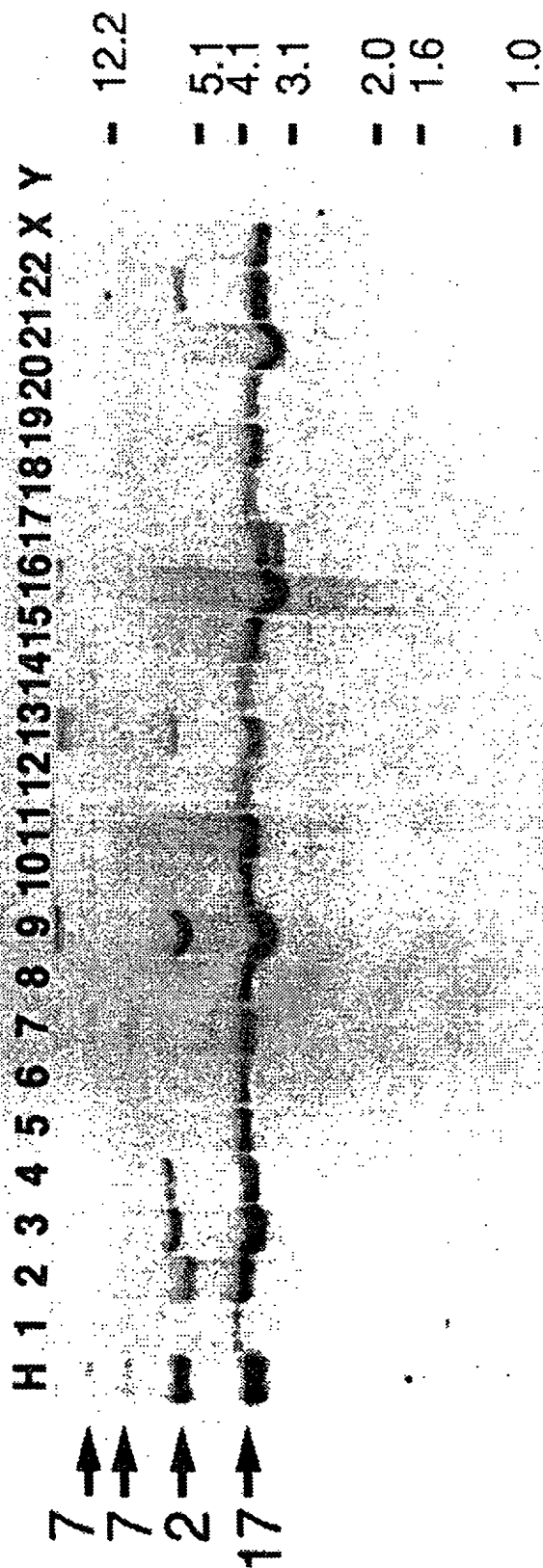
Chromosome



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d

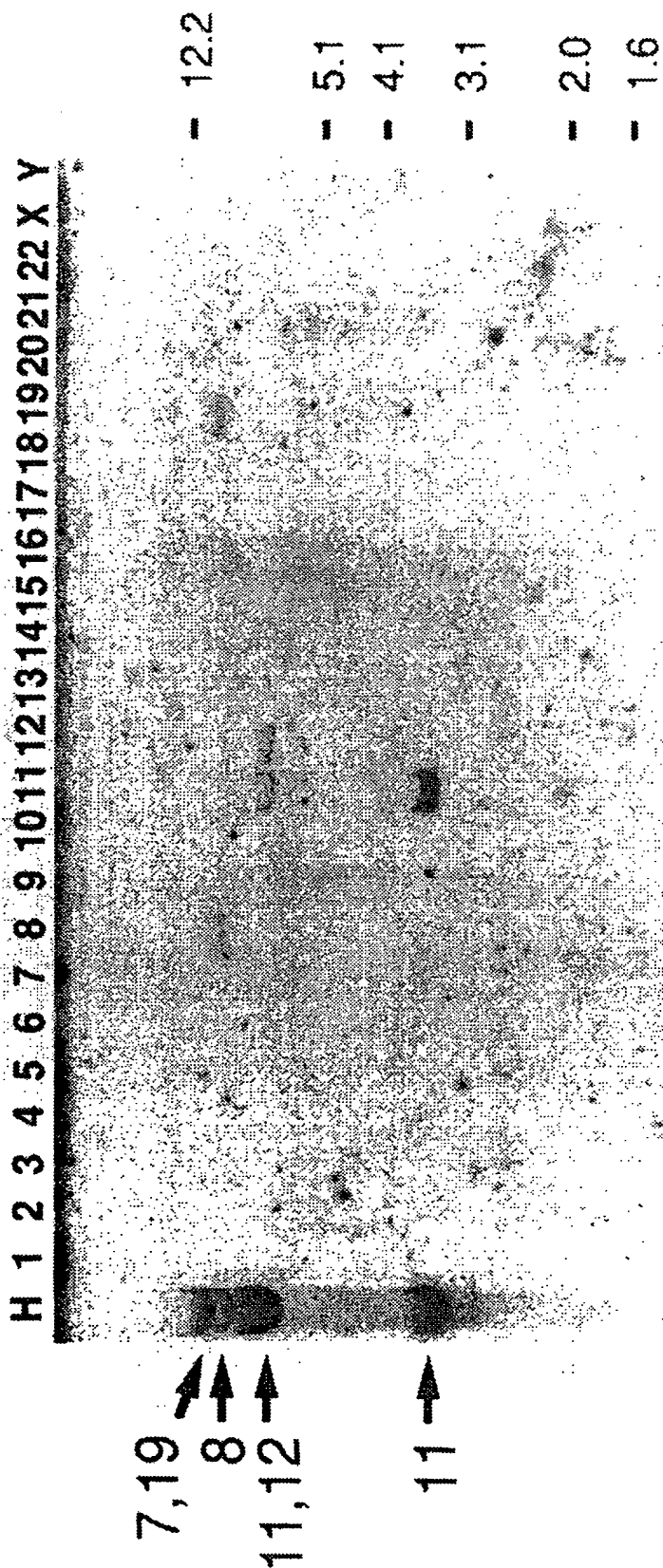
Chromosome



20

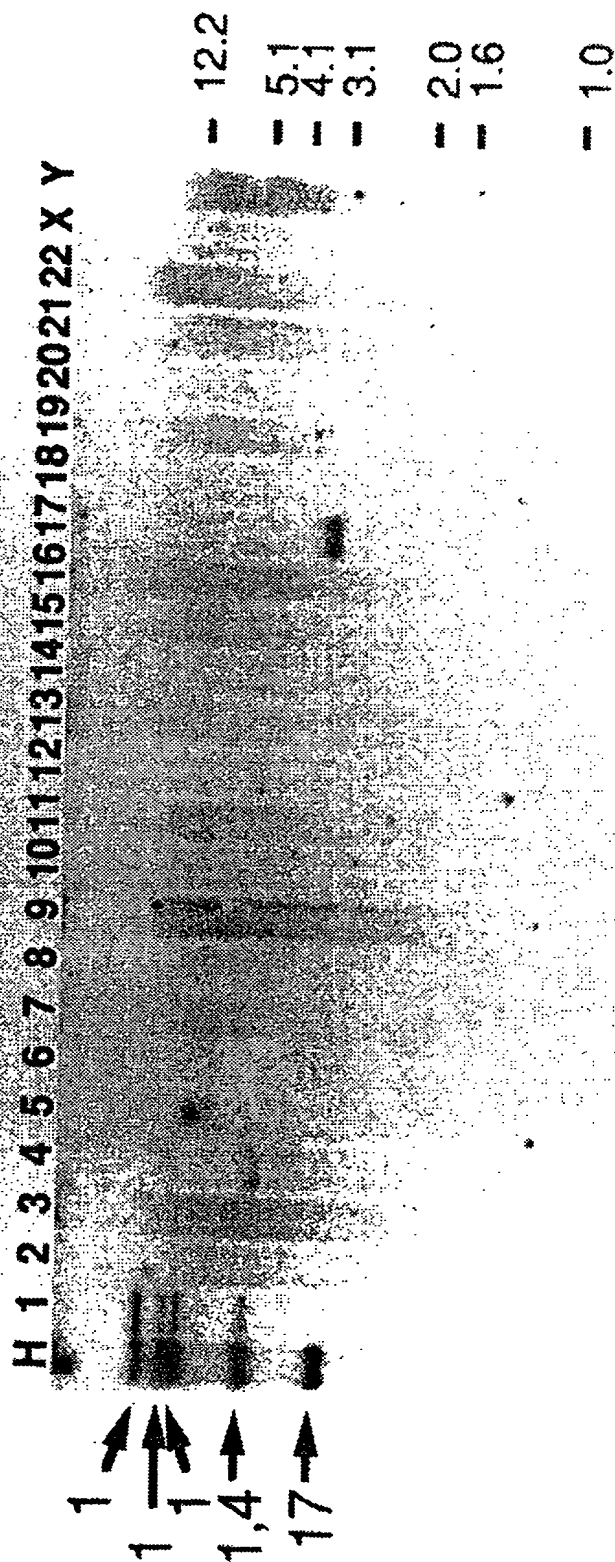
e

Chromosome



f

Chromosome



21

図 2 2

g

Chromosome

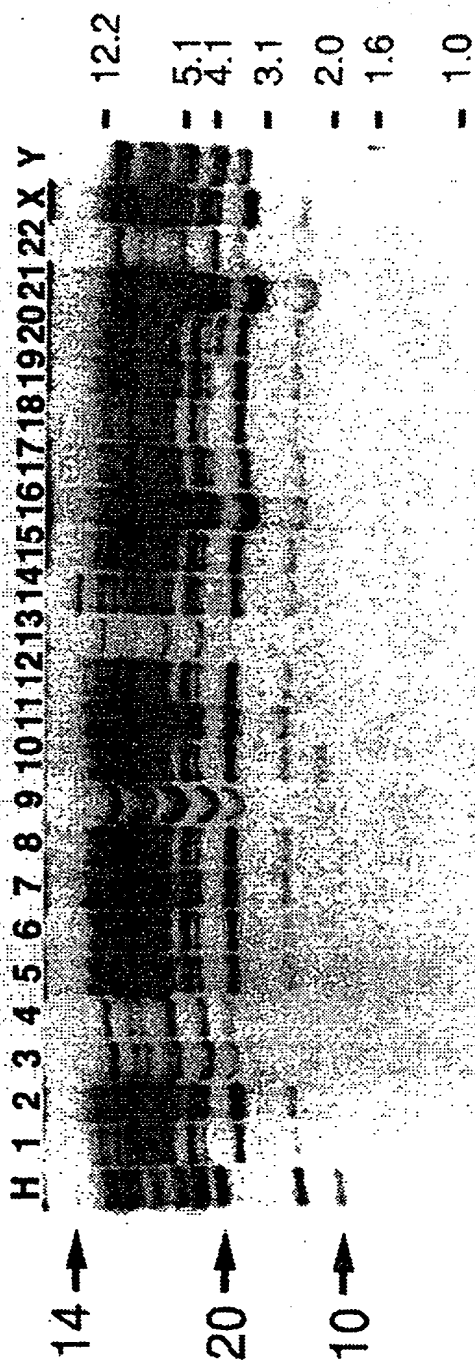


図 23

サザンブロッティング法による各GSの染色体へのマッピング

ヒト全染色体で出現したバンドの数		割当てられた染色体				バックグラウンド		
クローン名	配列長	E	E/Ba	E/Bg	Ba/Bg	マウス	チャイニーズ ハムスター	
(単一のバンドが出現したもの)								
c12c11	GS000075	432	1	1	1	9	0	0
c12e06	GS000062	540	1	1	1	6,15	0	0
c12g01	GS000280	212	1	1	1	2	1	1
c13c05	GS000117	359	1	1	1	11+	0	0
c13c07	GS000120	355	1	1	1	2	0	0
c13f10	GS000208	267	1	1	1	14	0	0
c13h01	GS000279	183	1	1	1	12+	0	0
c13h02	GS000322	167	1	1	1	6	0	0
d0g02	GS000095	397	1	1	1	8	0	0
d0h07	GS000164	313	1	1	1	11	1	1
d1b10	GS000348	153	1	1	1	20	0	0
hm01a12	GS000228	246	1	1	1	Y?	0	0
hm01c09	GS000428	157	0	1	1	1	0	0
hm01c12	junk	394	1	1	1	17	0	0
hm01f05	GS000066	454	1	1	1	19,22	0	0
hm01f10	GS000299	178	0	1	1	10	0	0
hm01g09	GS000053	477	1	1	1	6	0	0
hm01h07	GS000115	368	1	1	1	12	0	0
hm02a02	GS000130	344	1	1	1	4	0	0
hm02a04	GS000329	164	1	1	0	10	0	0
hm02c01	GS000203	271	1	1	1	16	0	0
hm02e01	GS000016	590	1	1	1	20	0	0
hm02e02	GS000342	156	0	1	1	14	0	0
hm02e05	GS000401	223	1	1	0	n.d.	0	0
hm02g02	GS000191	278	1	1	1	17	0	0
hm05a05	GS000251	219	1	1	1	6	2	0
hm05a10	junk	392	1	1	1	1	1	1
hm05c10	GS000009	606	1	1	1	1	0	0
kmd01	junk	169	1	1	1	n.d.	0	0
s105	GS000001	703	1	1	1	5	0	0
s110	GS000057	471	1	1	1	8	0	0
s11d11	GS000307	#175	0	0	0	7	0	0
s11h01	GS000269	204	1	1	1	8	0	0
s147	GS000060	461	1	1	1	2	0	0
s14e06	junk	639	1	1	1	1	0	0
s14g02	GS000152	322	1	1	1	4	0	0
s14h12	GS000271	198	1	1	1	4	1	1
s150	GS000143	330	1	1	1	17	0	0
s156	GS000002	806	1	1	1	2	1	1
s15b11	GS000250	221	1	1	1	14	0	0
s179	GS000275	196	1	1	1	n.d.	0	0
s246	GS000234	241	1	1	1	9	0	0
s247	GS000347	153	1	1	1	1	0	0
s270	junk	185	1	1	1	19	0	0

図 24

クローン名		ヒト全染色体で出現したバンドの数				割当てられた染色体		バックグラウンド	
		配列長	E	E/Ba	E/Bg	Ba/Bg		マウス	チャイニーズ・ハムスター
s306	GS000266	205	1	1	0	1	X	0	0
s309	GS000171	305	1	1	0	1	1	0	0
s342	GS000328	165	1	1	1	1	4	3	2
s381	GS000265	207	1	1	0	1	6,15	1	1
s384	GS000165	312	1	1	1	1	1	0	0
s387	GS000276	195	1	1	1	1	17	0	0
s389	GS000295	180	1	1	1	1	n.d.	0	1
s443	GS000330	251	1	1	1	1	n.d.	0	0
s470	junk	261	1	1	1	1	17	0	0
s474	GS000192	278	1	1	1	1	5	0	0
s503	junk	312	1	1	1	1	12	0	0
s507	junk	600	1	1	1	1	1	2	1
s517	GS000334	161	1	1	1	1	14	1	1
s632	junk	587	1	1	1	1	2	0	0
s633	GS000166	311	1	1	1	1	22	2	1
s650	GS000041	644	1	1	1	1	12	1	1
tw1-04	GS000026	537	1	1	1	1	3,7	0	0
tw1-19	GS000218	255	1	1	1	1	17	0	0
tw1-32	junk	250	1	1	1	1	5	0	0
tw1-37	GS000237	235	1	1	1	1	22	0	0
tw1-42	junk	391	1	1	1	1	8	1	1
tw1-48	GS000098	178	1	1	1	1	14	0	0
tw1-96	GS000138	389	1	1	1	1	11	0	0
(2本のバンドが出現したもの)									
c12f12	GS000195	277	1	2	2	2	1,	1	1
c13d02	GS000042	503	2	2	1	1	2,	0	0
hm01a06	GS000129	344	2	2	2	2	11,18	3	5
hm01a07	GS000207	269	2	2	2	2	7,	0	0
hm01d05	GS000232	243	2	2	2	1	2,	0	0
hm01e01	GS000181	292	2	2	2	2	1,2	0	0
hm02a08	GS000435	302	2	2	2	2	3,	1	1
hm02c04	GS000221	253	2	2	2	2	3,	0	0
hm02c05	GS000146	332	2	2	2	2	17,19,22	0	0
hm05f07	GS000043	503	1	1	2	1	3,	0	0
s11d06	GS000268	205	2	2	2	2	11,12	0	0
s11g12	GS000337	255	2	2	2	2	6,	0	0
s124	GS000088	404	2	2	2	2	9,	1	1
s144	GS000132	342	1	2	2	2	1,7	0	0
s14f08	GS000239	243	1	2	2	2	2,	3	2
s15e02	junk	439	2	2	1	2	6,	0	0
s16b09	junk	420	1	1	1	2	10,14	0	0
s17c09	GS000248	223	2	2	2	2	14,	0	0
s231	junk	284	2	2	2	2	11,	0	0
s254	GS000124	353	2	2	2	2	1,	3	1
s255	GS000235	239	2	2	2	2	11,	0	0
s272	junk	195	2	2	2	2	10,16	1	1

図 25

		ヒト全染色体で出現したバンドの数				割当てられた染色体		バックグラウンド	
クローン名	配列長	E	E/Ba	E/Bg	Ba/Bg			マウス	チャイニーズ ハムスター
s311	GS000092	383	1	1	2	2	16,	1	1
s313	junk	182	2	2	1	0	20,	0	0
s317	GS000100	389	0	0	1	2	14,14	1	1
s336	GS000184	387	2	2	2	2	12,14	0	0
s338	GS000189	283	2	2	2	1	22,X	0	0
s339	GS000283	187	2	1	1	2	17,	0	0
s394	GS000068	449	2	1	2	2	13,14	0	0
s396	junk	277	2	2	2	2	17,	0	1
s455	junk	452	1	2	2	1	4,	0	0
s456	GS000286	182	2	2	2	2	8,10	1	2
s465	GS000201	274	1	1	2	2	6,15	0	0
s635	junk	260	1	1	1	2	9,13	0	0
s639	GS000267	205	1	2	2	2	2,X	0	0
s656	GS000025 #590	2	2	0	2		6,11	0	0
tw1-33	junk	352	2	2	2	2	1,	0	0
tw1-39	GS000153 #321	2	2	2	2		17,	0	0
tw1-70	GS000061	441	1	1	2	1	11,	0	0
tw1-80	junk	453	2	2	1	2	9,17	2	2
tw1-87	GS000158	316	2	2	2	2	7,	0	0
(3本のバンドが出現したもの)									
d0h06	GS000080	417	3	3	3	1	1,	0	0
hm05b07	junk	386	2	3	3	3	5,	0	0
hm05g02	GS000209	267	2	2	2	1	3,17,19	1	1
s129	GS000107	378	3	3	3	3	n.d.	1	1
s178	GS000357	146	1	2	2	3	2,	0	0
s17a10	GS000294	181	3	3	3	3	2,13,22	1	1
s308	GS000412	688	2	2	2	3	XX	1	1
s401	GS000224	249	2	3	3	3	6,6,	0	0
s654	GS000045	491	3	3	3	3	1,22,	0	0
tw1-82	GS000208	267	3	3	3	3	13,	4	0
(4本のバンドが出現したもの)									
c12g07	GS000154	320	4	4	2	3	5, 14,	0	0
c13a08	GS000055	508	3	3	4	4	2,7,7,17	1	2
c13c04	GS000106 #376	4	3	3	3		n.d.	0	2
c13e09	GS000302	195	4	2	4	4	2,17,	7	2
s136	GS000160	315	4	4	4	4	4,X,	2	1
s163	GS000004 #618	4	4	4	2		4,4,8,20	3	1
s479	GS000180	293	4	4	2	2	7,8,11,11,12,19	0	0
(5本以上のバンドが出現したもの)									
c12f08	GS000253	217	5	5	5	2	2,7,9,14,	2	0
hc01	junk	374	12	12	15	18	1,2,6,	22	20
hd10	junk	361	4	4	4	8	n.d.	12	6
hc10	junk	178	6	2	3	3	6,8,9,19,21,	3	3
hm01c05	GS000305	176	9	7	5	5	X,	9	8
hm01f04	GS000246	215	8	10	5	5	n.d.	12	12
hm01g02	junk	411	9	6	6	4	10,14,20,	14	6

図 26

ヒト全染色体で出現したバンドの数						割当てられた染色体	バックグラウンド		
クローン名	配列長	E	E/Ba	E/Bg	Ba/Bg		マウス	チャイニーズ ハムスター	
hm02f09	GS000273	442	8	7	7	5	3,3,6,11,13,14,15,16	0	0
hm05a02	GS000096	373	5	6	4	6	2,8,17,	3	3
hm05a04	GS000236	#239	6	6	6	7	n.d.	8	5
kmb01	junk	350	3	5	5	5	13,	14	7
s11f06	GS000316	170	6	6	6	4	1,2,2,3,4,6,13,15,	0	3
s14f01	GS000407	262	12	11	10	9	1,6,9,13,	6	3
s173	GS000094	397	5	4	6	8	1,1,1,1,4,17	0	0
s265	GS000323	167	10	12	11	14	18,	9	5
s341	junk	494	9	9	8	6	n.d.	15	8
s406	GS000118	364	6	7	5	4	2,7,8,18,20,20	4	1
tw1-46	junk	593	9	10	10	10	1,1,2,2,6,11,X,	3	5
tw1-63	junk	203	8	10	10	12	3,4,	17	11
(バンドが出現しなかったもの)									
c13g02	GS000340	157	0	0	0	0	-	-	-
hm01e10	junk	232	0	0	0	0	-	-	-
hm02d11	GS000274	196	0	0	0	0	-	-	-
s328	GS000278	194	0	0	0	0	-	-	-
s359	GS000199	279	0	0	0	0	-	-	-
s511	junk	283	0	0	0	0	-	-	-
s645	GS000012	#784	0	0	0	0	-	-	-
s647	GS000105	360	0	0	0	0	-	-	-
s651	junk	540	0	0	0	0	-	-	-

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP94/01916

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl⁶ C12N15/11, C12Q1/68//G01N33/566

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int. Cl⁶ C12N15/11, C12Q1/68//G01N33/566

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

BIOSIS PREVIEWS, CAS ONLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Nucleic Acids. Res., Vol. 15, 1987, Ou, J. H. "Cloning and characterization of a human ribosomal protein gene with enhanced expression in fetal and neoplastic cells" p. 8919-8934	1-6 (164)
X	Differentiations, Vol. 33, 1986, Oshima, R. G. et al. "Comparison of mouse and human keratin 18:A component of intermediate filaments expressed prior to implantation" p. 61-68	1-6 (226)
X	J. Biol. Chem., Vol. 265, 1990, Wilkin, D. J. et al. "Isolation and sequence of the human farnesyl pyrophosphate synthetase cDNA:coordinate regulation of the mRNAs for farnesyl pyrophosphate synthetase, 3-hydroxy-3-methylglutaryl coenzyme A reductase, and 3-hydroxy-3-methylglutaryl coenzyme A synthetase" p. 4607-4614	1-6 (255)

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

February 6, 1995 (06. 02. 95)

Date of mailing of the international search report

March 7, 1995 (07. 03. 95)

Name and mailing address of the ISA/

Japanese Patent Office

Facsimile No.

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP94/01916

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J. Biol. Chem., Vol. 266, 1991, Batra, S. K. et al. "Molecular cloning and sequence analysis of the human ribosomal protein S16" p. 6830-6833	1-6 (275)
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X	J. Biol. Chem., Vol. 263, 1988, Fischer, R. et al. "Multiple divergent mRNAs code for a single human calmodulin" p. 17055-17062	1-6 (386)
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	Mol. Cell. Biol., Vol. 3, 1983, Cowan, N. J. et al. "Expression of human alpha-tubulin genes: interspecies conservation of 3' untranslated regions" p. 1738-1745	1-6 (820)
X	Nucleic Acids Res., Vol. 17, 1989, Taaman, J. W. et al. "Nucleotide sequence of cDNA encoding subunit VIB of human cytochrome c oxidase" p. 1766-1766	1-6 (844)
X	Gene, Vol. 93, 1990 Taanman, J. W., Schrage, C., Ponne, N., Das, A., Bolhuis, P. A., de Vries, H. and Agsteribbe, E. Isolation of cDNAs encoding Subunit VIB of human cytochrome c oxidase and steady-state levels of coxVIB mRNA in different tissues p. 285-291	1-6 (844)
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X	Oncogene, Vol. 5, 1990, Firnbach-Kraft, I. et al. "Tyk 2, prototype of a novel class of non-receptor tyrosine Kinase genes" p. 1329-1336	1-6 (1345)
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International application No.

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X	J. Cell Biol., Vol. 105, 1987, Argraves, W. S. et al. "Amino Acid Sequence of the Human Fibronectin Receptor" p. 1183-1190	1-6 (1607)
X	Nucleic Acids Res., Vol. 18, 1990, Liebhaber, S. A. et al. "Characterization of a human cDNA encoding a widely expressed and highly conserved cysteine-rich protein with an unusual zinc-finger motif" p. 3871-3879	1-6 (1642)
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X	Proc. Natl. Acad. Sci. U.S.A., Vol. 83, 1986, Ikuta, T. et al. "Three human alcohol dehydrogenase subunits: cDNA structure and molecular and evolutionary divergence" p. 634-638	1-6 (1864)
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim N .
X	J. Clin. Invest., Vol. 76, 1985, Cooke, N.E. et al. "Serum vitamin D-binding protein is a third member of the albumin and alpha fetoprotein gene family" p. 2420-2424	1-6 (1888)
X	J. Biol. Chem., Vol. 264, 1989, Huang, S.-H. et al. "Human deoxycytidine kinase: Sequence of cDNA clones and analysis of expression in cell lines with and without enzyme activity" p. 14762-14768	1-6 (1894)
X	J. Biol. Chem., Vol. 266, 1991, Huang, S.-H. et al. "Additions and corrections Human deoxytidine kinase. Sequence of cDNA clones and analysis of expression in cell lines with and without anzyme activity" p. 5353-5353	1-6 (1894)
X	Somat. Cell Mol. Genet., Vol. 11, 1985, Bell, G.I. et al. "Human alpha-2-macroglobulin gene is located on chromosome 12" p. 285-289	1-6 (1895)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 81, 1984, Yang, F. et al. "Human transferrin: cDNA characterization and chromosomal localization" p. 2752-2756	1-6 (1902)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 83, 1986, Ny, T. et al. "Cloning and sequence of a cDNA coding for the human beta-migrating endothelial-cell-type plasminogen activator inhibitor" p. 6776-6780	1-6 (1904)
X	J. Biol. Chem., Vol. 267, 1992, Bausch-Jurken, M. T. et al "Molecular cloning of AMP deaminase isoform L: Sequence and bacterial expression of human AMPD2 cDNA" p. 22407-22413	1-6 (1908)
X	Gene, Vol. 44, 1986, Board, P. G. et al. "Molecular cloning and nucleotide sequence of human alpha-1 acid glycoprotein cDNA" p. 127-131	1-6 (1921)
X	Eur. J. Biochem., Vol. 155, 1986, Wathelet, M. et al. "Molecular cloning, full-length sequence and preliminary characterization of a 56-kDa protein induced by human interferons" p. 11-17	1-6 (2101)

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International application No.

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim N .
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X	Biochemistry, Vol. 25, 1986, Koide, T. et al. "Amino acid sequence of human histidine-rich glycoprotein derived from the nucleotide sequence of its cDNA" p. 2220-2225	1-6 (2174)
X	Biochemistry, Vol. 22, 1983, Friezner-Degen, S. J. et al. "Characterization of the complementary deoxyribonucleic acid and gene coding for human prothrombin" p. 2087-2097	1-6 (2214)
X	Biochem. J., Vol. 268, 1990, Steinkasserer, A. et al. "Heterogeneity in human serum amyloid A protein. Five different variants from one individual demonstrated by cDNA sequence analysis." p. 287-193	1-6 (2238)
X	Nucleic Acids Res., Vol. 17, 1989, Fabrizi, G. M. et al. "Sequence of a cDNA specifying subunit VIIa of human cytochrome c oxidase" p. 7107-7107	1-6 (2264)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 86, 1989, Sims, J. E. et al. "Cloning of the interleukin 1 receptor from human T cells" p. 8946-8950	1-6 (2265)
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X	J. Virol., Vol. 65, 1990, Tsujimoto, A. et al. "Isolation of cDNA for DNA binding proteins which specifically bind to TAX-responsive enhancer element in the LTR of HTLA-1" p. 1420-1426	1-6 (2475)
X	Immunogenetics, Vol. 37, 1993, Emi, N. et al. "Isolation of a novel cDNA clone showing marked similarity to ME491/CD63 superfamily" p. 193-198	1-6 (2556)
X	Nature, Vol. 353, 1991, Kelly, A. P. et al. "A new human HLA class II-related locus, DM" p. 571-573	1-6 (2583)

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International application No.

PCT/JP94/01916

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Categ ry*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J. Biol. Chem., Vol. 265, 1990, Hla, T. et al. "An abundant transcript induced in differentiating human endothelial cells encodes a polypeptide with structural similarities to G-protein-coupled receptors" p. 9308-9313	1-6 (2600)
X	J. Biol. Chem., Vol. 267, 1992, White, R. T. et al. "Human adipsin is identical to complement factor D and expressed at high levels in adipose tissue" p. 9210-9213	1-6 (2802)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 87, 1990, Rouault, T. A. et al. "Cloning of the cDNA encoding RNA regulatory protein-the human iron-responsive element-binding protein" p. 7958-7962	1-6 (2832)
X	Nucleic Acids Res., Vol. 17, 1989, Sawada, R. et al. "Complementary DNA sequence and deduced peptide sequence for CD59/MEM43 antigen, the human homologue of murine lymphocyte antigen Ly-6c" p. 6728-6728	1-6 (2954)
X	DNA Cell Biol., Vol. 9, 1990, Sawada, R. et al. "Isolation and expression of the full-length cDNA encoding CD59 antigen of human lymphocytes" p. 213-220	1-6 (2954)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 87, 1990, Weller, P. A. et al. "Complete sequence of human vinculin and assignment of the gene to chromosome 10" p. 5667-5671	1-6 (2983)
X	Cell, Vol. 58, 1989, Mellentin, J. D. et al. "LYL-1, a novel gene involved by chromosomal translocation in T-cell leukemia, codes for a protein with a helix-loop-helix DNA binding motif" p. 77-83	1-6 (3023)
X	Cell, Vol. 60, 1990, Uze, G. et al. "Genetic transfer of a functional human interferon alpha receptor into mouse cells: Cloning and expression of its cDNA" p. 225-234	1-6 (3041)
X	Biochem. Biophys. Res. Commun., Vol. 179, 1991, Xiao, L. et al. "Characterization of a full length cDNA which codes for the human spermidine/spermine N-1-acetyltransferase" p. 407-415	1-6 (3053)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP94/01916

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J. Biol. Chem., Vol. 266, 1991, Casero, R. A. Jr. et al. "Isolation and characterization of a cDNA clone that codes for human spermidine/spermine N-1-acetyltransferase" p. 810-814	1-6 (3053)
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X	J. Cell Biol., Vol. 103, 1986, Lawler, J. et al. "The Structure of Human Thrombospondin, an/ adhesive Glycoprotein with Multiple Calcium binding Sites and Homologies with Several Different Proteins" p. 1635-1648	1-6 (3266)
X	Nature, Vol. 352, 1991, Maslen, C. L. et al. "Partial sequence of a candidate gene for the marfan syndrome" p. 334-337	1-6 (3334)
X	J. Cell Biol., Vol. 111, 1990, Fishman, G. I. et al. "Molecular Characterization and Functional Expression of the Human Cardiac Gap Junction Channel" p. 589-598	1-6 (3403)
X	Cell, Vol. 40, 1985, Ebina, Y. et al. "The human insulin receptor cDNA: The structural basis for hormone-activated membrane signalling" p. 747-758	1-6 (3447)
X	Oncogene, Vol. 5, 1990, Westin, E. H. et al. "Alternative splicing of the human c-myb gene" p. 1117-1124	1-6 (3529)
X	Genomics, Vol. 4, 1989, Todd, S. et al. "cDNA sequence, interspecies comparison and gene mapping analysis of argininosuccinate lyase" p. 53-59	1-6 (3575)
X	FEBS Lett., Vol. 207, 1986, Codina, J. et al. "-Subunits of the human liver Gs/Gi signal-transducing proteins and those of bovine retinal rod cell transducin are identical" p. 187-192	1-6 (3796)
X	Nucleic Acids Res., Vol. 18, 1990, Roessler, B. J. et al. "Cloning of two distinct copies of human phosphoribosyl pyrophosphate synthetase cDNA" p. 193-193	1-6 (3828)

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International application No.

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J. Biochem., Vol. 109, 1991, Sonoda, T. et al. "Complete nucleotide sequence of human phosphoribosyl pyrophosphate synthetase subunit I (PRS I) cDNA and a comparison with human and rat PRPS gene families" p. 361-364	1-6 (3828)
X	J. Biol. Chem., Vol. 263, 1988, Wermuth, B. et al. "Human carbonyl reductase: Nucleotide sequence analysis of a cDNA and amino acid sequence of the encoded protein" p. 16185-16188	1-6 (4033)
X	Biochim. Biophys. Acta. Vol. 1048, 1990, Forrest, G. L. et al. "Induction of a human carbonyl reductase gene located on chromosome 21" p. 149-155	1-6 (4033)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 88, 1991, Schuetz, T. J. et al. "Isolation of a cDNA for HSF2: Evidence for two heat shock factor genes in humans" p. 6911-6915	1-6 (4093)
X	Nucleic Acids Res., Vol. 13, 1985, Hallewell, R. A. et al. "Human Cu/Zn superoxide dismutase cDNA: isolation of clones synthesising high levels of active or inactive enzyme from an expression library" p. 2017-2034	1-6 (4110)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 80, 1983, Sherman, L. et al. "Nucleotide sequence and expression of human chromosome 21 - encoded superoxide dismutase mRNA" p. 5465-5469	1-6 (4110)
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X	J. Exp. Med., Vol. 172, 1990, Tekamp-Olson, P. et al. "Cloning and Characterization of cDNAs for Murine Macrophage Inflammatory Protein 2 and its Human Homologues" p. 911-919	1-6 (4452)

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PCT/JP94/01916

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X	Biochemistry, Vol. 30, 1991, Tomkinson, B. et al. "Characterization of cDNA for human tripeptidyl peptidase II: The N-terminal part of the enzyme is similar to subtilisin" p. 168-174	1-6 (4522)
X	J. Biol. Chem., Vol. 263, 1988, Verma, A. K. et al. "Complete primary structure of a human plasma membrane Ca ²⁺ pump" p. 14152-14159	1-6 (4673)
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X	J. Biol. Chem., Vol. 267, 1992, Mckenzie, T. L. et al. "Molecular cloning, expression, and characterization of the cDNA for the rat hepataic squalene synthase" p. 21368-21374	1-6 (4818)
X	Nucleic Acids Res., Vol. 13, 1985, Furutani, Y. et al. "Cloning and characterization of the cDNAs for human and rabbit interleukin-1 precursor" p. 5869-5882	1-6 (4872)
X	Proc. Natl. Acad. Sci U.S.A., Vol. 89, 1992, Katoh, M. et al. "K-sam gene encodes secreted as well as transmembrane receptor tyrosine kinase" p. 2960-2964	1-6 (4914)
X	Differentiation, Vol. 42, 1989, Kuruc, N. et al. "Synthesis of cytokeratin 13, a component characteristic of internal stratified epithelia, is not induced in human epidermal tumors" p. 111-123	1-6 (5264)
X	J. Biol. Chem., Vol. 266, 1991, Kiefer, M. C. et al. "Identification and molecular cloning of two new 30-kDa insulin-like growth factor binding proteins isolated from adult human serum" p. 9043-9049	1-6 (5374)

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PCT/JP94/01916

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim N .
X	J. Biol. Chem., Vol. 265, 1990, Oipari, A. W. et al. "The A20 cDNA induced by tumor necrosis factor alpha-encodes a novel type of zinc finger protein" p. 14705-14708	1-6 (5427)
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X	Cancer Res., Vol. 52, 1992, Kondoh, N. et al. "Differential expression of S19 ribosomal protein, laminin binding protein and HLA class I mRNAs associated with colon carcinoma progression and differentiation" p. 791-796	1-6 (6439)
X	J. Biol. Chem., Vol. 263, 1988, Collart, F. R. et al. "Cloning and sequence analysis of the human and chinese hamster inosine-5' -monophosphate dehydrogenase cDNA" p. 15769-15772	1-6 (6471)
X	J. Biol. Chem., Vol. 261, 1986, Romeo, P. -H. et al. "Molecular cloning and nucleotide sequence of a complete human uroporphyrinogen decarboxylase cDNA" p. 9825-9831	1-6 (6569)
X	J. Cell Biol., Vol. 106, 1988, Leube, R. E. et al. "Molecular characterization and expression of the stratification-related cytokeratins 4 and 15" p. 1249-1261	1-6 (6875)
X	Proc. Natl. Acad. Sci. U.S.A., Vol. 85, 1988, Daher, K. A. et al. "Isolation and characterization of human defensin cDNA clones" p. 7327-7331	1-6 (7106)
X	J. Exp. Med, Vol. 172, 1990, Larsen, A. et al. "Expression Cloning of a Human Granulocyte Colony-stimulating Factor Receptor: a Structural Mosaic of Hematopoietin Receptor, Immunoglobulin, and Fibronectin Domains" p. 1559-1570	1-6 (7126)

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X	Oncogene, Vol. 8, 1993, Schulz, A. S. et al. "The genomic structure of the human UFO receptor" p. 509-513	1-6 (7790)
A	Nature Genetics, Vol. 2, 1992, Okubo, K. et al. "Large scale cDNA sequencing for analysis of quantitative and qualitative aspects of gene expression" p. 173-179	1-6
A	Nature Genetics, Vol. 2, 1992, Khan, A. S. et al. "Single pass sequencing and physical and genetic mapping of human brain cDNAs" p. 180-188	1-6

A. 発明の属する分野の分類 (国際特許分類 (IPC))

Int. Cl.⁶ C12N15/11, C12Q1/68//G01N33/566

B. 調査を行った分野

調査を行った最小限資料 (国際特許分類 (IPC))

Int. Cl.⁶ C12N15/11, C12Q1/68//G01N33/566

最小限資料以外の資料で調査を行った分野に含まれるもの

国際調査で使用した電子データベース (データベースの名称、調査に使用した用語)

BIOSIS PREVIEWS, CAS ONLINE

C. 関連すると認められる文献

引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
X	Nucleic Acids., ^{Res.} 第15巻, 1987, Ou, J. H. et al. "Cloning and characterization of a human ribosomal protein gene with enhanced expression in fetal and neoplastic cells" p. 8919-8934	1-6 (164)
X	Differntiations, 第33巻, 1986, Oshima, R. G. et al. "Comparison of mouse and human keratin 18: A component of intermediate filaments expressed	1-6 (226)

☒ C欄の続きにも文献が列举されている。

☐ パテントファミリーに関する別紙を参照。

* 引用文献のカテゴリー

- 「A」 特に関連のある文献ではなく、一般的技術水準を示すもの
- 「E」 先行文献ではあるが、国際出願日以後に公表されたもの
- 「L」 優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献 (理由を付す)
- 「O」 口頭による開示、使用、展示等に言及する文献
- 「P」 国際出願日前で、かつ優先権の主張の基礎となる出願の日の後に公表された文献

「T」 国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの

「X」 特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの

「Y」 特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの

「&」 同一パテントファミリー文献

国際調査を完了した日

06.02.95

国際調査報告の発送日

07.03.95

名称及びあて先

日本国特許庁 (ISA/JP)

郵便番号100

東京都千代田区霞が関三丁目4番3号

特許庁審査官 (権限のある職員)

加藤 浩 印

4 B 9 0 5 0

電話番号 03-3581-1101 内線

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C (続き). 関連すると認められる文献		
引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
	prior to implantati n " p. 61-68	
X	J. Biol. Chem. , 第265巻, 1990, Wilkin, D. J. et al. " Isolation and sequence of the human farnesyl pyrophosphate synthetase cDNA: coordinate regulation of the mRNAs for farnesyl pyrophosphate synthetase, 3-hydroxy-3- methylglutaryl coenzyme A reductase, and 3- hydroxy-3-methylglutaryl coenzyme A synthetase p. 4607-4614	1-6 (255)
X	J. Biol. Chem. , 第266巻, 1991, Batra, S. K. et al. " Molecular cloning and sequence analysis of the human ribosomal protein S16 " p. 6830-6833	1-6 (275)
X	Proc. Natl. Acad. Sci. U. S. A. , 第87巻, 1990, Ben-Ishai, R. et al. " A human cellular sequence implicated in trk oncogene activation is DNA damage inducible " p. 6039-6043	1-6 (313)
X	J. Biol. Chem. , 第263巻, 1988, Fischer, R. et al. " Multiple divergent mRNAs code for a single human calmodulin " p. 17055-17062	1-6 (386)
X	J. Cell Biol. , 第108巻, 1989, Barnett, T. R. et al. " Carcinoembryonic antigens: Alternative splicing accounts for the multiple mRNAs that code for novel members of the carcinoembryonic antigen family " p. 267-276	1-6 (446)
X	J. Biol. Chem. , 第265巻, 1990, Natsumeda, Y. et al. " Two distinct cDNAs for human IMP dehydrogenase " p. 5292-5295	1-6 (454)
X	Genes Dev. , 第7巻, 1993, Patton, J. G. et al. " Cloning and charact rizati n of PSF a nov l pr -mRNA splicing factor " p. 393-406	1-6 (706)

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X	Nucl ic Acids R s. , 第16巻, 1988, Stanf rd , D. R. et al. "The complete primary structure of the human snRNP E protein" p. 10593—10605	1—6 (711)
X	Proc. Natl. Acad. Sci. U. S. A. , 第84巻, 1987, Inoue, C. et al. "Evolutionary conservation of the insulinoma gene rig and its possible function" p. 6659—6662	1—6 (723)
X	J. Immunol. , 第144巻, 1990, Jongstra—Bilen , J. et al. "Human and mouse LSP1 genes code for highly conserved phosphoproteins" p. 1104—1110	1—6 (741)
X	Biochem. J. , 第248巻, 1987, Sakai, I. et al. "The cDNA and protein sequences of human lactate dehydrogenase—B" p. 933—936	1—6 (772)
X	Biochim. Biophys. Acta. , 第1089巻, 1991, Tamura, T. et al. "Molecular cloning and sequence analysis of cDNAs for five major subunits of human proteasomes (multicatalytic proteinase complexes)" p. 95—102	1—6 (775)
X	Mol. Cell. Biol. , 第3巻, 1983, Cowan, N. J. et al. "Expression of human alpha—tubulin genes: interspecies conservation of 3' untranslated regions" p. 1738—1745	1—6 (820)
X	Nucleic Acids Res. , 第17巻, 1989, Taaman , J. W. et al. "Nucleotide sequence of cDNA encoding subunit VIb of human cytochrome c oxidase" p. 1766— 1766	1—6 (844)
X	Gene , 第93巻, 1990 Taanman, J. W. , Schrage, C. , Ponne, N. , Das, A. , Bolhuis, P. A. , de Vries, H. and Agsteribbe, E. Isolation of cDNAs encoding subunit VIb of human cytochr me c xidas and steady—stat lev ls f coxVIb mRNA in diff r nt tissues p. 285—291	1—6 (844)

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X	J. Biol. Chem. , 第264巻, 1989, Gray, P. W. et al. "Cloning of the cDNA of a human neutrophil bactericidal protein: Structural and functional correlations" p. 9505-9509	1-6 (861)
X	Immunogenetics , 第32巻, 1990, Angelisova, P. et al. "The human leucocyte surface antigen CD53 is a protein structurally similar to the CD37 and MRC OX-44 antigens" p. 281-285	1-6 (1158)
X	Proc. Natl. Acad. Sci. U. S. A. , 第88巻, 1991, Koken, M. H. et al. "Structural and functional conservation of two human homologs of the yeast DNA repair gene RAD6" p. 8865-8869	1-6 (1181)
X	Oncogene , 第5巻, 1990, Firmbach-Kraft, I. et al. "Tyk2, prototype of a novel class of non- receptor tyrosine kinase genes" p. 1329-1336	1-6 (1345)
X	Science , 第248巻, 1990, Smith, C. A. et al. "A receptor for human tumor necrosis factor defines an unusual family of cellular and viral proteins" p. 1019-1023	1-6 (1431)
X	J. Biol. Chem. , 第263巻, 1988, Luster, A. D. et al. "Molecular and biochemical characterization of a novel gamma-interferon-inducible protein" p. 12036-12043	1-6 (1455)
X	J. Clin. Invest. , 第83巻, 1989, Look, A. T. et al. "The human myeloid plasma membrane glycoprotein CD13(gp150) is identical to aminopeptidase N" p. 1299-1307	1-6 (1469)
X	J. Cell Biol. , 第105巻, 1987, Argraves, W. S. et al. "Amino Acid Sequence of the Human Fibronectin Receptor" p. 1183-1190	1-6 (1607)
X	Nucl ic Acids Res. , 第18巻, 1990, Li bhaber, S. A. et al. "Ch racterization f a human cDNA nc ding a	1-6 (1642)

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	widely expressed and highly conserved cysteine-rich protein with an unusual zinc-finger motif" p. 3871-3879	
X	J. Biol. Chem. , 第264巻, 1989, Didsbury, J. et al. "Rac, a novel ras-related family of proteins that are botulinum toxin substrates" p. 16378-16382	1-6 (1709)
X	EMBO J. , 第6巻, 1987, Willison, K. et al. "The human homologue of the mouse t-complex gene, TCP1, is located on chromosome 6 but is not near the HLA region" p. 1967-1974	1-6 (1749)
X	J. Biol. Chem. , 第266巻, 1991, Wu, Y. et al. "Activation of globin gene expression by cDNAs from induced K562 cells: Evidence for involvement of ferritin in globin gene expression" p. 17566-17572	1-6 (1785)
X	Proc. Natl. Acad. Sci. U. S. A. , 第83巻, 1986, Ikuta, T. et al. "Three human alcohol dehydrogenase subunits: cDNA structure and molecular and evolutionary divergence" p. 634-638	1-6 (1864)
X	Proc. Natl. Acad. Sci. U. S. A. , 第85巻, 1988, Fukumoto, H. et al. "Sequence, tissue distribution, and chromosomal localization of mRNA encoding a human glucose transporter-like protein" p. 5434-5438	1-6 (1878)
X	J. Clin. Invest. , 第76巻, 1985, Cooke, N. E. et al. "Serum vitamin D-binding protein is a third member of the albumin and alpha fetoprotein gene family" p. 2420-2424	1-6 (1888)
X	J. Biol. Chem. , 第264巻, 1989, Huang, S.-H. et al. "Human deoxycytidine kinase: Sequence of cDNA clones and analysis of expression in cell lines with and without enzymatic activity" p. 14762-14768	1-6 (1894)

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X	J. Biol. Chem. , 第266巻, 1991, Huang, S. -H. et al. "Additions and corrections Human deoxytidine kinase. Sequence of cDNA clones and analysis of expression in cell lines with and without enzyme activity" p. 5353-5353	1-6 (1894)
X	Somat. Cell Mol. Genet. , 第11巻, 1985, Bell, G. I. et al. "Human alpha-2-macroglobulin gene is located on chromosome 12" p. 285-289	1-6 (1895)
X	Proc. Natl. Acad. Sci. U. S. A. , 第81巻, 1984, Yang, F. et al. "Human transferrin: cDNA characterization and chromosomal localization" p. 2752-2756	1-6 (1902)
X	Proc. Natl. Acad. Sci. U. S. A. , 第83巻, 1986, Ny, T. et al. "Cloning and sequence of a cDNA coding for the human beta-migrating endothelial-cell-type plasminogen activator inhibitor" p. 6776- 6780	1-6 (1904)
X	J. Biol. Chem. , 第267巻, 1992, Bausch-Jurken, M. T. et al. "Molecular cloning of AMP deaminase isoform L: Sequence and bacterial expression of human AMPD2 cDNA" p. 22407-22413	1-6 (1908)
X	Gene, 第44巻, 1986, Board, P. G. et al. "Molecular cloning and nucleotide sequence of human alpha-1 acid glycoprotein cDNA" p. 127-131	1-6 (1921)
X	Eur. J. Biochem. , 第155巻, 1986, Wathelet, M. et al. "Molecular cloning, full-length sequence and preliminary characterization of a 56-kDa protein induced by human interferons" p. 11-17	1-6 (2101)
X	Nucleic Acids Res. , 第11巻, 1983, Ch bath, J. t al. "Interf ron induc d 56,000mr pr tein and its mRNA in human c lls: mol eular cl ning	1-6 (2101)

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	and partial sequence of the cDNA" p. 1213—1226	
X	Biochemistry, 第25巻, 1986, Koide, T. et al. "Amino acid sequence of human histidine-rich glycoprotein derived from the nucleotide sequence of its cDNA" p. 2220—2225	1—6 (2174)
X	Biochemistry, 第22巻, 1983, Friezner-Degen, S. J. et al. "Characterization of the complementary deoxyribonucleic acid and gene coding for human prothrombin" p. 2087—2097	1—6 (2214)
X	Biochem. J., 第268巻, 1990, Steinkasserer, A. et al. "Heterogeneity in human serum amyloid A protein. Five different variants from one individual demonstrated by cDNA sequence analysis." p. 187—193	1—6 (2238)
X	Nucleic Acids Res., 第17巻, 1989, Fabrizi, G. M. et al. "Sequence of a cDNA specifying subunit VIIa of human cytochrome c oxidase" p. 7107—7107	1—6 (2264)
X	Proc. Natl. Acad. Sci. U. S. A., 第86巻, 1989, Sims, J. E. et al. "Cloning of the interleukin 1 receptor from human T cells" p. 8946—8950	1—6 (2265)
X	Eur. J. Biochem., 第169巻, 1987, Mackinnon, C. M. et al. "Molecular cloning of cDNA for human complement component C1a. The complete amino acid sequence" p. 547—553	1—6 (2266)
X	J. Virol., 第65巻, 1990, Tsujimoto, A. et al. "Isolation of cDNA for DNA binding proteins which specifically bind to TAX-responsive enhancer element in the LTR of HTLA-1" p. 1420—1426	1—6 (2475)
X	Immunogenetics, 第37巻, 1993, Emi, N. et al.	1—6

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	"Isolation of a novel cDNA clone showing marked similarity to ME491/CD63 superfamily" p. 193-198	(2556)
X	Nature, 第353巻, 1991, Kelly, A. P. et al. "A new human HLA class II-related locus, DM" p. 571-573	1-6 (2583)
X	J. Biol. Chem., 第265巻, 1990, Hla, T. et al. "An abundant transcript induced in differentiating human endothelial cells encodes a polypeptide with structural similarities to G-protein-coupled receptors" p. 9308-9313	1-6 (2600)
X	J. Biol. Chem., 第267巻, 1992, White, R. T. et al. "Human adipsin is identical to complement factor D and expressed at high levels in adipose tissue" p. 9210-9213	1-6 (2802)
X	Proc. Natl. Acad. Sci. U. S. A., 第87巻, 1990, Rouault, T. A. et al. "Cloning of the cDNA encoding RNA regulatory protein-the human iron-responsive element-binding protein" p. 7958-7962	1-6 (2832)
X	Nucleic Acids Res., 第17巻, 1989, Sawada, R. et al. "Complementary DNA sequence and deduced peptide sequence for CD59/MEM43 antigen, the human homologue of murine lymphocyte antigen Ly-6c" p. 6728-6728	1-6 (2954)
X	DNA Cell Biol., 第9巻, 1990, Sawada, R. et al. "Isolation and expression of the full-length cDNA encoding CD59 antigen of human lymphocytes" p. 213-220	1-6 (2954)
X	Proc. Natl. Acad. Sci. U. S. A., 第87巻, 1990, Weller, P. A. et al. "Complete sequence of human vinculin and assignment of the gene to chromosome 10" p. 5667-5671	1-6 (2983)

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X	Cell, 第58巻, 1989, Mellentin, J. D. et al. "LYL-1, a novel gene involved by chromosomal translocation in T-cell leukemia, codes for a protein with a helix-loop-helix DNA binding motif" p. 77-83	1-6 (3023)
X	Cell, 第60巻, 1990, Uze, G. et al "Genetic transfer of a functional human interferon alpha receptor into mouse cells: Cloning and expression of its cDNA" p. 225-234	1-6 (3041)
X	Biochem. Biophys. Res. Commun., 第179巻, 1991, Xiao, L. et al. "Characterization of a full length cDNA which codes for the human spermidine/spermine N-1-acetyltransferase" p. 407-415	1-6 (3053)
X	J. Biol. Chem., 第266巻, 1991, Casero, R. A. Jr. et al. "Isolation and characterization of a cDNA clone that codes for human spermidine/spermine N-1-acetyltransferase" p. 810-814	1-6 (3053)
X	Nucleic Acids Res., 第20巻, 1992, Wintzerith, M. et al. "Sequence of the human RNA polymerase II largest subunit" p. 910-910	1-6 (3083)
X	J. Cell Biol., 第103巻, 1986, Lawler, J. et al. "The Structure of Human Thrombospondin, an/ adhesive Glycoprotein with Multiple Calcium- binding Sites and Homologies with Several Different Proteins" p. 1635-1648	1-6 (3266)
X	Nature, 第352巻, 1991, Maslen, C. L. et al. "Partial sequence of a candidate gene for the marfan syndrome" p. 334-337	1-6 (3334)
X	J. Cell Biol., 第111巻, 1990, Fishman, G. I. et al. "Molecular Characterization and Functional Expression of the Human Cardiac Gap Junction Channel" p. 589-598	1-6 (3403)

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X	C 11, 第40巻, 1985, Ebina, Y. et al. "The human insulin receptor cDNA: The structural basis for hormone-activated membrane signalling" p. 747-758	1-6 (3447)
X	Oncogene, 第5巻, 1990, Westin, E. H. et al. "Alternative splicing of the human c-myc gene" p. 1117-1124	1-6 (3529)
X	Genomics, 第4巻, 1989, Todd, S. et al. "cDNA sequence, interspecies comparison and gene mapping analysis of argininosuccinate lyase" p. 53-59	1-6 (3575)
X	FEBS Lett., 第207巻, 1986, Codina, J. et al. "-Subunits of the human liver Gs/Gi signal-transducing proteins and those of bovine retinal rod cell transducin are identical" p. 187-192	1-6 (3796)
X	Nucleic Acids Res., 第18巻, 1990, Roessler, B. J. et al. "Cloning of two distinct copies of human phosphoribosyl pyrophosphate synthetase cDNA" p. 193-193	1-6 (3828)
X	J. Biochem., 第109巻, 1991, Sonoda, T. et al. "Complete nucleotide sequence of human phosphoribosyl pyrophosphate synthetase subunit I (PRS I) cDNA and a comparison with human and rat PRPS gene families" p. 361-364	1-6 (3828)
X	J. Biol. Chem., 第263巻, 1988, Wermuth, B. et al. "Human carbonyl reductase: Nucleotide sequence analysis of a cDNA and amino acid sequence of the encoded protein" p. 16185-16188	1-6 (4033)
X	Biochim. Biophys. Acta. 第1048巻, 1990, Forrest, G. L. et al. "Induction of a human carbonyl reductase gene located on chromosome 21" p. 149-155	1-6 (4033)
X	Proc. Natl. Acad. Sci. U. S. A., 第88巻, 1991, Schuttz, T. J. et al.	1-6 (4093)

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	"Isolation of a cDNA for HSF2: Evidence for two heat shock factor genes in humans" p. 6911-6915	
X	Nucleic Acids Res., 第13巻, 1985, Hallewell, R. A. et al. "Human Cu/Zn superoxide dismutase cDNA: isolation of clones synthesizing high levels of active or inactive enzyme from an expression library" p. 2017-2034	1-6 (4110)
X	Proc. Natl. Acad. Sci. U. S. A., 第80巻, 1983, Sherman, L. et al. "Nucleotide sequence and expression of human chromosome 21-encoded superoxide dismutase mRNA" p. 5465-5469	1-6 (4110)
X	J. Biol. Chem., 第268巻, 1993, David, V. et al. "Interaction with newly synthesized and retained proteins in the endoplasmic reticulum suggests a chaperone function for human integral membrane protein IP90 (calnexin)" p. 9585-9592	1-6 (4373)
X	J. Exp. Med., 第172巻, 1990, Tekamp-Olson, P. et al. "Cloning and Characterization of cDNAs for Murine Macrophage Inflammatory Protein 2 and its Human Homologues" p. 911-919	1-6 (4452)
X	Biochemistry, 第30巻, 1991, Tomkinson, B. et al. "Characterization of cDNA for human tripeptidyl peptidase II: The N-terminal part of the enzyme is similar to subtilisin" p. 168-174	1-6 (4522)
X	J. Biol. Chem., 第263巻, 1988, Verma, A. K. et al. "Complete primary structure of a human plasma membrane Ca ²⁺ pump" p. 14152-14159	1-6 (4673)
X	J. Biol. Chem., 第267巻, 1992, Shechter, I. et al. "Subtilization, purification and characterization of truncated form of rat	1-6 (4818)

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X	hepatic squalene synthetase" p. 8628-8635 J. Biol. Chem. , 第267巻, 1992, McKenzie, T. L. et al. "Molecular cloning, expression, and characterization of the cDNA for the rat hepatic squalene synthase" p. 21368-21374	1-6 (4818)
X	Nucleic Acids Res. , 第13巻, 1985, Furutani, Y. et al. "Cloning and characterization of the cDNAs for human and rabbit interleukin-1 precursor" p. 5869-5882	1-6 (4872)
X	Proc. Natl. Acad. Sci. U. S. A. , 第89巻, 1992, Katoh, M. et al. "K-sam gene encodes secreted as well as transmembrane receptor tyrosine kinase" p. 2960-2964	1-6 (4914)
X	Differentiation, 第42巻, 1989, Kuruc, N. et al. "Synthesis of cytokeratin 13, a component characteristic of internal stratified epithelia, is not induced in human epidermal tumors" p. 111-123	1-6 (5264)
X	J. Biol. Chem. , 第266巻, 1991, Kiefer, M. C. et al. "Identification and molecular cloning of two new 30-kDa insulin-like growth factor binding proteins isolated from adult human serum" p. 9043-9049	1-6 (5374)
X	J. Biol. Chem. , 第265巻, 1990, Pipari, A. W. et al. "The A20 cDNA induced by tumor necrosis factor alpha-encodes a novel type of zinc finger protein" p. 14705-14708	1-6 (5427)
X	J. Biol. Chem. , 第265巻, 1990, McLean, J. W. et al. "cDNA sequence of the human integrin beta- 5 subunit" p. 17126-17131	1-6 (5715)

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X	Cell, 第66巻, 1991, Ge, H. et al. "primary structure of the human splicing factor ASF reveals similarities with drosophila regulators" p. 373-382	1-6 (5860)
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